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Hunterian Lectures
ON
LINKS IN A CHAIN OF RESEARCH ON SYPHILIS.

Delivered before the Royal College of Surgeons of England

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LECTURE II.[1]

Delivered on March 8th, 1916.

MR. PRESIDENT AND GENTLEMEN,—It will be remembered that, in the "side-chain" theory, Ehrlich considered that the union between antibody and antigen was due to chemical affinities which each of these bodies possessed for one another. Then Ehrlich conceived the idea that the principle could be applied to treatment, "chemotherapy" being the name which the application later received.

CHEMOTHERAPY.

The principle was shortly this: To find drugs, the chemical groups of which would combine with the chemical groups of the parasites to be attacked, without combining with the chemical groups of the host's cells. The chemical groups of both the drugs and the cells received the name of "chemoceptors." The disease which Ehrlich hoped to combat was sleeping sickness, and as arsenic was the body which appeared to have the greatest influence upon the disease experiments were undertaken with this metal.

For some time after the commencement of his experiments Ehrlich appears to have been of the opinion that the sole receptors between the chemical groups in the protoplasm of the parasites and in the drugs used were the arsenic receptors. How Ehrlich could ever think that arsenic would find its chemical affinity in the protoplasm of cells, and it is to be remarked, in only certain cells, is difficult to understand, and it is surprising that most of us should still consider that this element is of paramount importance in the synthetic antisyphilitic remedies. That other receptors existed as well was shown only when it was noted that the action of arseno-phenyl-glycine was not affected by previously subjecting the parasites to the action of the arsenic derivative of phenyl-oxy-acetic acid. Then it was assumed that acetic acid receptors existed as well. As fatty acid receptors were said to exist in the protoplasm of the parasites, it was only logical to suppose that amino-acid receptors would be found there also. Working upon this hypothesis Ehrlich discovered salvarsan.

According to Ehrlich, salvarsan works by means of its arsenic receptors and its ortho-amino-phenol receptors. When it was discovered later that a certain drug had a fatal action on one kind of parasite and not upon another kind, although in both instances a "combination" occurred between the drug and the bodies of the parasites, some further explanation of the action of salvarsan was required. Consequently, salvarsan was stated to act in the following way: The arsenic was considered to be the toxophore group, the benzene ring the carrier, and the amino groups the haptophore groups.

Summing up Ehrlich's views as to the mode of action of salvarsan, we find that a union takes place between the drug and certain parasites, with a destructive action upon the latter. What the nature of the union is, and why the death of only certain parasites should follow, are not explained.

There are two facts which stand out in Ehrlich's work on chemotherapy, and which appear to have been overlooked by him and his school, but which, nevertheless, are important, as they go some way towards explaining the *modus operandi* of the subject. The first fact is that trypanosomes can be rendered arsenic-fast, and that organisms which have been rendered arsenic-fast are immune to arsenical compounds only. To this there is an important exception. For instance, it was found that organisms which had been rendered immune to the arsenical compounds were also immune to pyronin. The other fact is that, although salvarsan could be proved to enter into "combination" with the bodies of many, if not of all, parasites *in vitro*, it did not necessarily exert a fatal action upon them all, but only upon organisms such as the trypanosome, the spirochæta pallida, the spirillum of recurrent fever, &c.

From the points I have already brought forward dealing with the cause of syphilis, the chemistry of the organism, and the rationale of the Wassermann reaction, I will attempt to explain what is the probable action of salvarsan. When this is complete I will deal with some points about the chemistry of the drug and its allied bodies, and then with the lines of research along which I thought chemotherapy would afford the best results, culminating in my discovery of some new drugs which are considerably less toxic than the arsenical compounds.

MODE OF ACTION OF ANTISYPHILITIC DRUGS.

Before discussing the mode of action of the antisyphilitic drugs it is necessary first to pay some attention to the way in which the body naturally protects itself against syphilis. The protective power of the body can be divided into two groups: (1) the power which acts generally—i.e., the lipoid-globulin molecules of the serum; (2) the power which acts locally—i.e., the plasma cells.

The plasma cell is typical of chronic inflammation, whatever be the cause thereof. In all instances the plasma cell is morphologically the same, but, although its gross action is similar in every instance, it is nevertheless specific in each case. To be more exact, one should call the specificity a group specificity, not an individual specificity, since the plasma cells behave in the same manner, as is to be here described, in trypanosomiasis as in syphilis, and also in some other diseases. This specificity exhibited by the plasma cells is the same as that exhibited by the lipoid-globulin molecules of the serum, and, so far as it concerns chemotherapy, it is solely due to certain physical properties which these two protective powers possess in protozoal diseases. In other words, the specific action of the synthetic antisyphilitic remedies is not due to chemico-physical properties which constitute specificity, as we see it in infections and in specific immunity reactions.

Properties of Antiprotozoal Lipoid-globulin Molecules.

Consideration must now be given to these peculiar physical properties of the antiprotozoal lipoid-globulin molecules. The lipoid-globulin molecules in the serum of protozoal diseases, especially in syphilis, are characterised by their large size and their increased adsorptive capacity. As the disease becomes more and more chronic, the size of the molecules and their adsorptive capacity increase. As has been already explained, a parasite is vanquished *in vivo* by a change which takes place on its surface. This change causes a local alteration of the surface tension, which so disturbs the normal permeability that the organism perishes. This change is brought about by adsorption. Like most physical and chemico-physical reactions, the phenomenon of adsorption is dependent upon active oxygen. Therefore some ratio exists between the destructive power of a molecule and its supply of active oxygen. In the early stages of the disease it is naturally to be expected that the supply of active oxygen will be as great as the body without extra assistance can manage. If the supply of active oxygen is not sufficient to rid the host of its parasites, the disease becomes chronic, and, all the direct methods of producing active oxygen having failed, the host is obliged to obtain it indirectly. Active oxygen is obtained indirectly by increasing the reducing action; hence the reason why the lipoid-globulin molecules are larger and have a greater adsorptive and reducing action in late than in early cases of syphilis.

There are three actions exhibited by the lipoid-globulin molecules in the serum: (1) adsorption; (2) oxidation; (3) reduction. In virtue of the size and of the increased adsorptive capacity of the antiprotozoal lipoid-globulin molecules, it will follow that their powers of oxidation and reduction may be enhanced by oxidising and reducing agents, and that a ratio must exist between the amount of active oxygen and active hydrogen produced and the degree of the adsorbed state in which the oxidising and reducing agents are.

More light can be thrown on this interesting subject if attention be now paid to the active oxygen and active hydrogen contents of cells. This may be best done by

[1] Lecture I. was published in THE LANCET of May 13th, 1916, p. 981.

referring to the oxygen positions in the cells as a chain, "the oxygen chain," and then by referring to the hydrogen positions. Each link of the oxygen chain is made up of a peroxide and a ferment (peroxidase), which activates it in various degrees, according as to whether the first or last link of the chain is being dealt with. The first link is the red blood corpuscle, which contains a peroxide and a peroxidase; the ferment action is further increased by the iron in the hæmoglobin, which acts as a catalyst in the form of an hydroxide. Oxidising enzymes have their action increased by metals; attention need only be drawn to the accelerating action manganese has upon some plant oxidases in support of this statement. Red blood corpuscles supply every tissue with oxygen in an active state.

The next link in the chain is a mast cell, one of the functions of which is to supply the basal cell layer of the epidermis with the active oxygen for the tyrosine-tyrosinase reaction, which results in the production of pigment, and this is one of the protective mechanisms of the body. In support of this statement reference need only be made to the well-recognised increase of mast cells in urticaria pigmentosa, ephelides, and all known pigmentary affections of the skin. Another function is, possibly, to supply the next link with free active oxygen—namely, the nuclei of the cells of inflammation.

The next link in the chain is an eosinophile cell, the action of which is probably analogous to that of the mast cell. Between these two cells there is a fundamental difference, which is a difference of reaction. The mast cell granules are basophilic, the eosinophile granules are acidophilic. In some chronic infections the mast cell predominates; in others the eosinophile cell is most to the fore; both are carriers of peroxidases, hence the reaction of the base, as to whether it is acid or basic, possibly plays some rôle in the combating of infections.

The nuclei constitute the next link, as they contain a peroxide and a ferment (peroxidase) for activating the same, but this ferment is not nearly so strong as the peroxidase in the first three links. The activated oxygen in the nucleus is used mainly for the purpose of division, and partly by the protoplasm of the cell.

The last link in the chain is the protoplasmic, which contains a peroxide, but only a feeble peroxidase. The main peroxidase probably comes directly from the nucleus, and indirectly from other cells which contain peroxidases, through the blood serum. The oxygen positions are those in which active oxygen can be demonstrated, the active oxygen being formed by the action of ferric hydroxide protein (peroxidase) on hydrogen peroxide (peroxide) according to the following equations:—

$$R.Fe + 4H_2O = R.Fe(OH)_3 + 4H^{\cdot} + OH'$$
$$R.Fe(OH)_3 + 5H + 2H_2O_2 = R.Fe + 6H_2O + O''$$

The hydrogen positions are to be found very marked in the mast cell granules, in the lipoid-globulin "envelope" of nucleoli and in the protoplasm of plasma cells. These positions are recognised by the affinity they possess for pyronin, and by the ease with which they decolourise methylene violet, methyl green, and malachite green.

The reducing action of the lipoid-globulin molecules, or, as it may be called, the reducase system, is analogous to the oxidising action or the oxidase system. A perhydridase takes the place of a peroxidase, and a perhydride the place of a peroxide. The action of a perhydridase on a perhydride is to form active hydrogen, which corresponds to the active oxygen in the oxidase system. The perhydridase is a di-sulphide protein, and the equation of its action is as follows:—

$$2\,R.SH + S = H_2S + R.S.S.R.$$
$$R.S.S.R. + 2H + 4OH = R.S. + R.SH. + 2H_2O_2 + H^{\cdot}$$

It is seen, then, that in the reducase system a non-metal takes the place of a metal.

Results of Treatment with Metals and Non-Metals.

Summing up the last few points, it may be noted that metals increase the production of active oxygen, and non-metals the production of active hydrogen. Therefore, from what has gone before, it will now be seen that extra active oxygen can be produced in the serum of the host, directly by the administration of strongly adsorbed metallic compounds, and indirectly by the administration of strongly adsorbed non-metallic compounds. Without treatment, the lesions of syphilis vanish because the lipoid-globulin molecules of the serum and the plasma cells contain a stereo-chemical molecular configuration homologous to those of the parasitic lipoid-globulin molecules, an homology which is necessary for perfect adsorption, and because they contain active oxygen necessary for the adsorption which is formed directly by iron hydroxide and indirectly by a disulphide.

Since we do not know the chemical formula of the protozoal lipoid-globulin particles, it is impossible to synthesise a compound homologous to them. Therefore the only way in which we can assist the host is to increase his supply of active oxygen, which we do directly with arsenic, aluminium and iron, and possibly also with antimony, and indirectly with iodine and sulphur. The degree of action of these elements is regulated by three factors, which will be more fully discussed later, but it may be mentioned here that they are (1) molecular weight; (2) valency; (3) as to whether the compound is strongly adsorbed or not.

Treatment then assists the host's resistance by increasing his amount of active oxygen. Therefore, treatment destroys the parasites indirectly, and not directly, as Ehrlich thought.

A most interesting point now arises—namely, why are the spirochætæ destroyed more quickly than the other phases, and why so quickly by the metallic compounds? Chemistry showed that the male gamete, or spirochæta pallida, had the strongest reducing action of all the phases. In *in vivo* staining it showed a marked affinity for methylene-red, and it increased the reducing action of the female cell after impregnation. In this very strong reducing action in my view lies the solution of the problem as to why the adult male phase, the female phase after impregnation, and not the other phases, stain with silver nitrate in Levaditi's method of staining, and as to why metallic compounds act more markedly upon the first two than do the non-metallic compounds.

The reducing action is due to an unsaturated fatty acid—a substance in which the male cell is specially rich—for two reasons: (1) because it is the result of an intracellular development; (2) because it has a very important function to perform—namely, that of impregnation. In other phases where the metabolism is less active and the cells are more or less in resting forms, the fatty acids are more likely to be saturated than unsaturated. The more unsaturated a fatty acid is in a complex the more free hydroxyl groups will there be. To these free hydroxyl groups different chemical substances can become attached, especially if they are free metals possessing a positive charge; therefore the spirochæta pallida, owing to the fact that it contains more free hydroxyl groups, can have its lipoid-globulin molecules altered by substances which combine immediately with them.

In staining tissue with silver nitrate in order to get a black colour two things are necessary: one is that the silver must be adsorbed; the other is that it must be reduced *in situ*. Owing to the free hydroxyl groups in the lipoid-globulin "envelope" of the spirochæta pallida the silver is readily taken up and reduced by the pyrogallic acid. In the other phases, on the other hand, there are no free hydroxyl groups to take up the silver, so they therefore cannot stain black. The action of the metallic compounds is also to be explained in this way.

The arsenic, aluminium, and iron in their respective compounds—salvarsan, aluvine, and ferrivine—become liberated after the amino groups in the compounds have become adsorbed by the lipoid-globulin molecules. The free metals, being positively charged and tri-valent, will adsorb three atoms of the negatively charged hydroxyl ion, and, as more of the metal becomes deposited in those positions in which the parasites are located in their avidity for free hydroxyl ions, they will naturally seize upon some belonging to the adult male phase and to the female phase after impregnation, hence the immediate death of these two phases.

As there are no free hydroxyl groups in the other phases the metals cannot become so readily attached to them. The destruction of the other phases is brought about indirectly by the stimulating effect the metals have upon the adsorptive action of the protoplasm of the plasma cells and of the lipoid-globulin molecules (antibody) of the serum. Therefore, the action of salvarsan upon the spirochætæ is wholly a direct one, and upon the other phases an indirect one.

Mode of Action of Salvarsan.

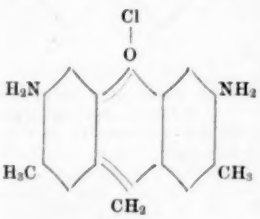
The question might now very naturally be asked, if the action of salvarsan is an indirect one, why arsenic should be more active than mercury, since under ordinary circumstances the latter is a more powerful antisyphilitic remedy. In my opinion, arsenic acts as a catalyst—i.e., it accelerates a reaction going on spontaneously, but more slowly without its assistance. Mercury possibly acts in the same way, but in virtue of its high atomic weight, its action is more probably felt in the influence it exerts on mechanical adsorption.

A ratio exists between the intensity of action of a catalyst and the degree of the colloid state in which the catalyst is. In salvarsan the arsenic is in a colloidal state, hence its action would necessarily be greater than that of any mercurial compound which we are in the habit of using. The proof of what has been said can be found, if we compare the action that different manganese compounds have on plant oxidases. Manganese formate, for instance, has nothing like such a powerful accelerating action upon plant oxidases as manganese hydroxide. The latter is colloidal, and the former is not.

In many other synthetic organic arsenical compounds the arsenic is also in a colloidal state, but the action of the drug is very inferior to that of salvarsan. Therefore this fact at once suggests that salvarsan, when injected, becomes fixed to the substance which the arsenic is going to accelerate, and it proves that a ratio exists between the therapeutic action of a drug and the degree of its adsorbed state.

Since the "606" molecule enters into adsorption with the lipoid-globulin molecules of a syphilitic serum and of the plasma cells in a case of syphilis, it will be seen that Ehrlich's statement that the drug is parasitotropic only and not organotropic cannot hold good. For a drug to be parasitotropic it must be organotropic; indeed, its organotropic properties are far more important than its parasitotropic properties.

The importance of the two points which were brought out in Erhlich's work can now be discussed. If there is a relationship between arsenical immunity and pyronin immunity it cannot be the arsenic to which the parasites become immune. If the formula of pyronin is studied it will be noticed that there are two amino groups. Now there are two amino groups in salvarsan, and from what has been already said it would appear to be due to these two amino groups that the drug becomes attached to the syphilitic parasites, to the plasma cells, and to the lipoid-globulin molecules of a syphilitic serum.



Pyronin.

In view of the fact that parasites which are salvarsan-fast are also pyronin-fast, it proves that immunity is not acquired against the arsenic, therefore the parasites cannot be strictly said to be arsenic-fast. So far as future experimental work is concerned, it is a very important fact to have in front of one—namely, that an immunity cannot be produced against a catalyst. The fact that salvarsan can become attached to parasites, and yet not be fatal to them, is an observation in which there is a great deal wrapped up. It must be observed that such an adsorption could only have been proved by experiments conducted *in vitro*.

During the time when I was working at the rationale of the Wassermann reaction I thought that for adsorption to take place between two molecules, both of which possessed amino groups, it was necessary that they should have homologous stereo-chemical molecular configurations. This idea soon proved to be wrong, when fixation occurred between both a non-specific antigen and an antigen whose amino groups had been converted into methylene-imino groups by formalin, and the reagin or the lipoid-globulin molecules of the serum (antibody) from a case of syphilis. As a result of further experiments I proved that the complement-fixation test, as applied to syphilis, in contradistinction to the true bacterial complement-fixation tests, depended not upon the molecules having a homologous stereo-chemical molecular configuration, but solely upon their number and size.

Application of this to the action of salvarsan and of the other synthetic compounds confirms the points just mentioned. The attachment of these compounds to the syphilitic parasites, to the plasma cells, and to the lipoid-globulin molecules in a case of syphilis, cannot possibly be due to an homologous stereo-chemical molecular configuration between the adsorbed molecules, since, for one thing alone, the synthetic compounds are optically inactive bodies.

The adsorptive capacity as a whole appears to be greater in the case of a syphilitic serum than in the case of a serum from any bacterial disease, and it appears to be greater the later the case of syphilis. As the lipoid-globulin molecules from a late case of syphilis are richer in carboxyl groups than those from an early case of syphilis, it follows that any substance they happen to adsorb will tend to break down the molecules. The first action of breaking down the lipoid-globulin molecules is to increase the area over which they can work; hence the probable reason why late syphilitic lesions disappear more quickly under treatment than do early ones. In my opinion, in the case of syphilis, and in all protozoal diseases, the lipoid-globulin molecules appear to be bigger, and to have a greater adsorptive capacity than the lipoid-globulin molecules in the serum of bacterial diseases. I do not wish to infer that there is a hard-and-fast line between protozoal and bacterial diseases, since in chronic bacterial diseases the lipoid-globulin molecules of the serum approach in their action to those in protozoal diseases, since the continued use of oxidising and especially of reducing agents has a marked remedial effect. I need only refer to the use of iodine and intramine in tuberculosis, chronic ulcus molle, and chronic gonorrhœa.

The bigger the size of the molecule, and the greater its adsorptive capacity, the more easily will a drug like salvarsan be adsorbed, and the more readily the adsorbed compound will break down. When the lipoid-globulin molecules first break down, the area of their action is widened, hence the catalytic action of the arsenic will have its fullest play. If salvarsan became attached to small molecules the adsorbed compound would not break down; at all events, not until much later than it does in the case of syphilis. Moreover, as much of the arsenic compound would not be adsorbed, this would mean that the arsenic would get little chance of acting as a catalyst. Therefore, salvarsan seems to act especially in protozoal diseases because of the physical state of the lipoid-globulin molecules of the serum, and it fails to act as a bactericidal agent, because the lipoid-globulin molecules in the serum of bacterial diseases do not possess the requisite physical properties. From the fact that Ehrlich noticed that it was only such organisms as the spirochæta pallida, the spirillum of recurrent fever, and the trypanosome which were killed by the action of salvarsan *in vitro*, two conclusions are to be deduced: (1) that the spirillum of recurrent fever and the trypanosome are killed directly because of the free hydroxyl groups their molecules contain; (2) that the trypanosome cannot be the sole cause of sleeping sickness.

To sum up the points which stand out, we can, in short, say that strongly adsorbed metallic and non-metallic compounds become attached to the lipoid-globulin molecules of the syphilitic parasite, the plasma cells, and the serum by virtue of their amino groups and of the peculiar physical properties of the protozoal lipoid-globulin molecules. The metallic compounds attack those phases of the leucocytozoon syphilidis in which reaction is most marked, especially the spirochætal phase, in virtue of its free hydroxyl groups.

Both metals and non-metals act as catalysts—that is to say, they accelerate the complementary or oxidase-reducase action of the lipoid-globulin molecules of the serum and of the plasma cells by increasing directly and indirectly the supply of active oxygen, which is necessary for the action of adsorption—a chemico-physical action which destroys the parasites.

CHEMISTRY OF THE ARSENICAL COMPOUNDS.

As the chemistry of the arsenical compounds is well known, and as I have other and more important points to discuss, I will pass over the main part of this subject.

If salvarsan is compared with atoxyl and arsacetin it will be seen that in salvarsan the arsenic is tri-valent, while in atoxyl and arsacetin the arsenic is penta-valent. Arsenic in a penta-valent state is less active in exerting its therapeutic influence on protozoa than when it is in a tri-valent

state. This is due to the fact that, in a molecule in which all the valencies are satisfied, the influence desired is less likely to act than when some of the valencies are not satisfied. In this connexion Hardy's rule is an important one to bear in mind—viz., that the precipitating power of an electrolyte depends upon the valency of the ion. From this it is clear that no compound of a uni-valent ion would be likely to have a therapeutic action at all akin to that of salvarsan. Therefore, so far as future research is concerned, the element must at least be a di-, or, better, a tri-valent ion.

Apart from mere valency, two other important considerations present themselves: (1) the degree of adsorption of the compound; (2) the atomic weight of the element. Ishizaka made the important observation that a strongly adsorbed organic anion, such as salicylic acid, was more powerful in precipitating aluminium hydroxide than a weakly adsorbed uni-valent inorganic ion. Hence, to obtain the best therapeutic action with the compound, we see that it must be organic, and the more strongly adsorbed it is the better, the reason being that a ratio exists between the strength of adsorption of the compound and the power it has in diminishing the mechanical surface energy.

It is now clear why salvarsan should be so much more effective that arseno-phenyl-glycine, arsacetin, or atoxyl. Freundlich and Schucht found that, in the precipitation of a negative colloid by kations, those of the heavy metals and of organic bases were more active than would be expected from their valency, and that this was to be accounted for by the fact of their great mechanical adsorption. This observation shows us, then, not only why mercury should be useful in syphilis, but also why it should be toxic. Owing to the great mechanical adsorption exerted by the heavy metals, it is at once obvious that strongly adsorbed organic compounds of them would be too toxic for injection.

Studying the rationale of chemotherapy in this way, one may be saved from doing an amount of useless experimental work by excluding all uni-valent and di-valent elements and all those elements which have high atomic weights. Seeing that arsenic, a tri-valent element in the form of a di-oxy-di-amino-benzene compound, may be toxic, the atomic weight being only 75, and that the corresponding compound of antimony, di-oxy-di-amino-stibino-benzene, is more toxic still, the difference in the atomic weight being only (120 − 75 =) 45, it is perfectly clear that if we wish to find a non-toxic compound we shall have to seek for elements which are tri-valent with a smaller atomic weight. Before mentioning the elements I tried there are one or two other points to be considered.

Di-oxy-di-amino-stibino-benzene, according to Hügel, is not only more toxic than its corresponding arsenic compound, but its therapeutic action is infinitely less. Comparing the two bodies, we find that the arsenic in salvarsan is both metallic and non-metallic, while in the antimony compound just mentioned the antimony is entirely metallic. It therefore struck me that a less metallic element than arsenic might prove to be its therapeutic superior; in any case the probability was great that it would be considerably less toxic. Salvarsan is a strong oxidising body; indeed, its arsenic acts catalytically, as a peroxidase, but at the same time it is a reducing agent, although its properties in this direction are probably not made use of in the body. This led me to think that a similar body to salvarsan, which had stronger reducing properties, would probably do just what salvarsan failed to do.

I wanted, then, an element which had the following properties: (1) of more than one valency; (2) an atomic weight of less than 75; (3) a non-metal; (4) a reducing agent. Only two elements occurred to me which would fulfil these conditions, and those were phosphorus and sulphur. I discarded phosphorus, owing to the fact that it can produce very toxic symptoms, such as fatty degeneration of the liver, so I conducted experiments with sulphur and succeeded in making a compound which has in some respects a more powerful therapeutic action than that of salvarsan. I prepared several compounds, but soon found that one was much superior to the others, and this one was di-ortho-amino-thio-benzene, or "intramine," as it is commercially called.

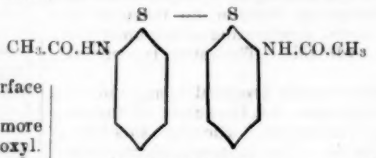
Further research showed me that it was highly probable that other metallic compounds could be found, which would prove to be as efficacious as and less toxic than salvarsan. Seeing that the metal must be tri-valent and not of high atomic weight, I began to experiment with iron, manganese, and aluminium. In a short time I was able to prepare some compounds of iron and aluminium, which turned out to be non-toxic and to have, if used in sufficient doses, as good as if not better therapeutic action than salvarsan.

NEW SYNTHETIC ANTISYPHILITIC DRUGS.

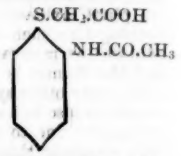
I will only briefly touch upon the drugs I have prepared, as I am anxious to give a short account of the practical value of my researches.

Non-Metallic Compounds (Sulphur).

I prepared two basic and two acid compounds. The first acid compound was the acetyl derivative of di-ortho-amino-thio-benzene, and the second acid compound was the condensation product of the base with mono-chloracetic acid.

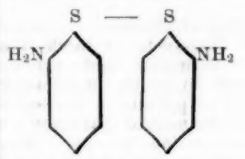


Acetyl derivative of intramine.

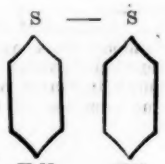


Condensation product with mono-chloracetic acid.

These two products may be quickly dismissed, as both were extremely painful when injected intramuscularly, and their therapeutic action was practically nil, which was to be expected since the amino groups have been interfered with. The two basic compounds prepared were di-para-amino-thio-benzene and di-ortho-amino-thio-benzene. As the therapeutic action of the former was not as good as that of the latter it was discarded.



Di-ortho-amino-thio-benzene (intramine).



Di-para-amino-thio-benzene.

Intramine can be prepared as a mass which goes into a fine amorphous powder when dried, or as crystals; both are light yellow in colour with a greenish tint. Intramine is absolutely non-toxic, consequently any dose may be employed, and it may be repeated as often as is thought necessary. The usual dose I employ for an adult is 1 gm., this quantity being suspended in 9 c.c. olive oil or liquid paraffin, and injected intramuscularly. Intramine does not oxidise on exposure to air, therefore the unused contents of a phial need not be thrown away, and a wide-mouthed bottle containing several grammes may be kept and used like mercurial cream.

When compared with salvarsan I soon found that in the primary and generalisation stages salvarsan was superior to intramine, but that in the recurrent stages the opposite was the case. Further experiments showed me that in the early stages of syphilis previous administration of a metallic compound greatly increased the action of intramine, but that in the recurrent and late stages intramine increased the action of the metallic compounds.

When I came to realise that metals acted as oxidising agents and non-metals as reducing agents—a realisation fully justified when I found that salvarsan was better in early syphilis and that intramine was better in late syphilis, oxidation being more marked than reduction in the former, and *vice versa* in the latter—I tried other metallic compounds to see how their therapeutic action compared with that of salvarsan. The two metallic compounds used were the hydroxides of aluminium and iron. As both these hydroxides are suspensoid colloids, and therefore cannot be injected intravenously without producing anaphylactic shock, unless calcium chloride is injected beforehand or the animal is anæsthetised with ether, &c., it was necessary to convert them into emulsion colloids, which I did with glycine, albumin, or gelatin. Injected intravenously into human beings as emulsoids, both the hydroxides of iron and

aluminium caused an amelioration of the symptoms in cases of early syphilis, and enhanced the value of intramine injected afterwards, but they did not prove so valuable as salvarsan. This result was to be expected, since these hydroxides are not powerfully adsorbed bodies like salvarsan and intramine. Although when converted into emulsoid colloids with glycine, albumin, or gelatin, amino groups exist in the compound, there is no powerful adsorption between the metal and the amino groups as there is in salvarsan and intramine.

Mode of Action of Intramine.

Before describing the metallic compounds I prepared it will be as well to dilate further upon the mode of action of intramine. Having already made several allusions to the *modus operandi* of intramine, to save recapitulation I will begin with its action in the oxidase-reducase system. The oxidase-reducase system can be expressed in short as the hydroxyl-hydrogen system of the internal phase. On to the hydroxyl group the metallic ion becomes attached; normally the metal is iron; when salvarsan is injected it is arsenic, &c. This metallic hydroxide combines with hydrogen ions and hydroxyl ions in the form of hydrogen peroxide to form active oxygen, as per following equation:—

$$R.Fe.(OH)_3 + 5H + 2H_2O_2 = R.Fe + 6H_2O + O''$$

The iron-protein, which is formed as the result of the reaction, soon becomes reconverted into iron hydroxide-protein, as in the following equation:—

$$R.Fe + 4H_2O = R.Fe(OH)_3 + 4H + OH.$$

When intramine gets into the body the compound presumably breaks down at the link between the two sulphur atoms. The sulphur then forms di-sulphide-protein, which reacts with the hydrogen and hydroxyl ions of the external phase to form sulphur-protein, mercaptan-protein, hydroxyl ions in the form of hydrogen peroxide and active hydrogen, as per this equation:—

$$R.S.S.R. + 2H + 4OH = R.S. + R.SH + 2H_2O_2 + H.$$

In this way two molecules of peroxide hydrogen are formed, exactly the amount required for the metallic hydroxide to act upon, to form active oxygen. Metals, then, form active oxygen directly, and non-metals indirectly. The mercaptan-protein is able to combine with any free sulphur, to form hydrogen sulphide and di-sulphide-protein, as in the following equation:—

$$2R.SH + S = H_2S + R.S.S.R.$$

The mercaptan-protein is also able to combine with any free oxygen, to form water and di-sulphide-protein, as in this equation:—

$$2R.SH + O = R.S.S.R. + H_2O$$

That the above is quite logical follows from the relationship between oxygen and sulphur, as shown in such compounds as cyanates: thio-cyanates (R.CNO:R.CNS), and urea: thio-urea.

$$CO\begin{matrix}NH_2\\NH_2\end{matrix} \qquad CS\begin{matrix}NH_2\\NH_2\end{matrix}$$

Adding the knowledge just obtained to that gained by clinical observation, further light is thrown upon the affinity of mercaptan-protein for oxygen. If the mercaptan group becomes oxidised by the active oxygen present there will be less active oxygen resulting from the oxidising action of the metallic hydroxide; hence, if intramine is given first and salvarsan afterwards in early syphilis, when the greatest quantity of active oxygen is present, one would expect that those phases of the leucocytozoon syphilidis which are most easily killed by oxidation would be able to flourish, that the customary therapeutic action of salvarsan would not be witnessed, and that the symptoms might even be temporarily aggravated. This is exactly what happens clinically. The spirochætæ are not killed quickly by intramine, and if salvarsan is given directly afterwards it appears to have no immediate influence on the symptoms.

If the metallic compounds are allowed their full play first, as the catalysts of the oxidase system, the introduction subsequently of a strong reducing agent like intramine would, in virtue of its action, set free sufficient peroxide to be subsequently converted into active oxygen by the metallic compounds, thereby preventing the adverse action of the mercaptan-protein. If this is so, one would expect that the phases of the leucocytozoon syphilidis would be quickly vanquished, and that the symptoms of the disease would rapidly disappear. Once again this is exactly what happens clinically. If metallic compounds be first administered in early syphilis the spirochætæ are killed at once and the symptoms improve. If intramine be now injected the other phases are killed immediately, and the symptoms vanish at a very much quicker rate than they otherwise would have done. I need only cite one case to show the truth of this.

A patient had a typical Hunterian chancre in the corona there was a moderate loss of surface, and the sore was markedly indurated. I gave an intravenous injection of galyl (40 cg.), and three days later an intramuscular injection of intramine (3 gm.). There was practically no change in the chancre when the intramine was given, but a few days later not only had the sore completely healed but the induration had entirely vanished.

I have seen severe papular syphilides scarcely influenced by galyl alone, as the following case shows, disappear in a few days when intramine was injected.

The patient had a primary sore in the corona, hard infiltrative œdema of the whole of the penis, and a generalised papular syphilitic eruption. No improvement followed three intravenous injections of galyl: instead more papules appeared. Within ten days after one injection of intramine every lesion had vanished.

In the recurrent and late stages of syphilis the exact opposite to what has just been said would be expected, since in these stages the reducing action of the resisting substance is more powerful than the oxidising action. One case again will suffice to prove this.

A patient had a gumma which encircled the corona and spread on the under surface of the penis on to the scrotum. In less than one week, after receiving only one intramuscular injection of intramine (2 gm.), the ulceration had completely healed. If this case had been treated with salvarsan alone it would have taken about three weeks for the sores to have healed up, and during this time it would have been necessary to have given two or three intravenous injections.

I have treated with immediate success by intramine late syphilitic lesions which had remained practically uninfluenced by salvarsan with mercury and iodides subsequently. I must cite a case which bears this out to the letter.

A man, 70 years of age, had had syphilitic glossitis for 25 years. Eighteen months before he was given intramine he had two intravenous injections of salvarsan, and these were followed by three courses of mercury and iodides, with practically no improvement in the clinical condition. When an intramuscular injection of intramine was prescribed (2 gm.) the tongue exhibited the following features. There was an ulcer in the centre about the size of a sixpence, with a lateral fissure running from it on both sides. Just posterior to the ulcer a hard wart was situated. The movements of the tongue were impeded and very painful. In a few weeks after the injection the ulcer had completely healed, the fissures and wart had vanished, the natural movements of the tongue and its suppleness had returned, and in the words of the patient, "My tongue has never been so well as long as I can remember."

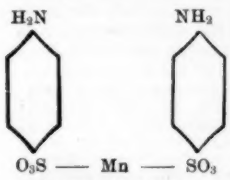
METALLIC COMPOUNDS.

Manganese.

In view of the experimental work which had been done in connexion with the activation of oxygen by manganese hydroxide, I tried to see what effect adsorbed colloidal compounds of manganese would have in syphilis. As the atomic weight of manganese is only 20 below that of arsenic (As = 74·96, Mn = 54·93), the therapeutic effect to be obtained from the use of the former would, on *a priori* grounds, be less than that from the use of the latter. On the other hand, it was possible that, if manganese proved less toxic than arsenic, the loss of action might be compensated by using a greater quantity of the drug. Further work showed me that, if one metallic drug was less potent than another, the same therapeutic effect might be obtained by using a greater quantity of the former, but that there was no direct proportionality between the quantity used and the effect produced. This is an extremely important point, as it shows that the metals, and, for that matter, the non-metal sulphur, as in intramine, are catalysts.

As intramine is a drug which is best administered intramuscularly, I thought it would be better, if possible, to prepare soluble compounds of the metals so that they could be injected intravenously. To prepare soluble compounds I thought metallic compounds of sulphanilic acid would be the easiest to manufacture, in view of the difficulties which are presented by the ortho-amino-benzene

compounds, consequently the first manganese preparation made was di-para-amino-benzene-manganese sulphonate.



Di-para-amino-benzene-manganese sulphonate.

Di-para-amino-benzene-manganese sulphonate forms a claret-coloured solution in water, it is acid, and is readily broken down on the addition of an alkali. When injected intravenously into rabbits, the animals die almost instantaneously from anaphylactic shock. The excess of hydroxyl ions in the blood doubtless breaks the compound down at once and forms manganese oxy-hydroxide ($MnO_2(OH)_2$).

$$Mn + 2OH + 2O = MnO_2(OH)_2.$$

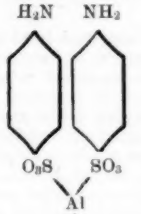
It will be noticed in the equation that two atoms of oxygen are used up; therefore, not only is the metal not acting as an oxidising agent, but it is increasing the hydrogen-ion concentration, with the result that the animal dies at once. To avoid this it is necessary to prepare the tri-para-body, so that the moment the manganese became free, it could combine with three hydroxyl atoms to form manganese hydroxide ($Mn(OH)_3$), but, unfortunately, the tri-valent compounds of manganese are so very unstable.

Aluminium.

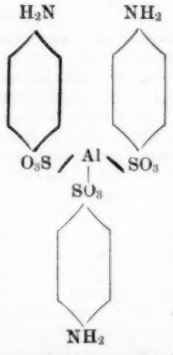
Aluminium struck me as a useful metal to experiment with, as it can only form tri-valent compounds. Although its atomic weight is low, only 27, I nevertheless thought I might be able, if its compounds proved non-toxic, to achieve good results, by using very big doses. Aluminium is well known as an oxidising metal; Gessard showed that the red oxidation product which results from the action of tyrosinase on tyrosine may be quickly converted into the black melanin by salts of aluminium. Bach also showed that aluminium had the action of converting the oxidation product which results from the action of phenolase on pyrogallol into purpurogallin.

In passing, it might be interesting to note that melanin, the pigment in the epidermis, is formed by the action of tyrosinase on tyrosine. This action is an oxidase reaction, and it is an action which is increased by metals. Syphilitic lesions, especially when they have been treated with arsenic, are very apt to leave pigment stains behind them, showing that the oxidase reaction is very marked in such lesions and that it is increased by metals. This simple observation goes far to prove my theory that the syphilitic parasites are destroyed indirectly by oxidation, and that arsenic and some other metals act in virtue of their oxidising action.

The aluminium bodies prepared were the di-para-amino-hydroxy-benzene-aluminium sulphonate and the tri-para-amino-benzene-aluminium sulphonate, the formulæ of which are as follows:—



Di-para-amino-hydroxy-benzene-aluminium sulphonate.



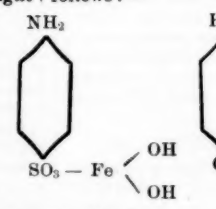
Tri-para-amino-benzenealuminium-sulphonate.

Tri-para-amino-benzene-aluminium sulphonate, or, as it is commercially called, "Aluvine," is a crystalline body, soluble in water, in which it forms a colourless solution. Aluvine is acid and readily breaks down on the addition of an alkali; therefore, when it is injected intravenously some of the metal quickly combines with three hydroxyl atoms, to form aluminium hydroxide. If a syringe is used for giving the injection, the blood which enters the syringe quickly forms a flocculent precipitate, which is, in part, the metallic hydroxide. The observer might be alarmed at injecting such into the vein, but as it is an emulso-suspensoid, it is perfectly safe. The method of injecting fluids intravenously is so much better than allowing the solution to enter by gravity, because if a suspensoid is present in the solution, the blood which enters the syringe will quickly give it an emulsoid coating. I am of the opinion that the reason why I have had so little trouble with the thousands of intravenous injections which I have given is due to the fact that I use a syringe.

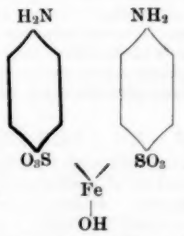
If properly prepared, the aluminium compounds, of which the tri-para body appears to be the better, are absolutely non-toxic, and, as far as I have been able to determine, any dose may be given, and it may be repeated as often as is desired. Patients can be treated as out-patients because no immediate or late manifestations arise. The first dose does not, as a rule, make much difference to the lesions, but within a few days after the second they quickly disappear.

Iron.

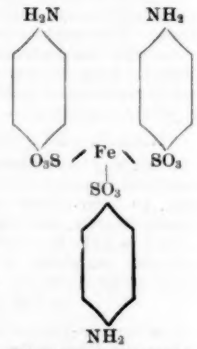
As iron seemed to me to be the natural peroxidase, and having obtained such good results with intramine, a drug which increases the natural perhydridase, I anticipated equally good results from the use of an adsorbed iron compound. The iron bodies prepared were the para-amino-di-hydroxy-benzene-ferric sulphonate, the di-para-amino-hydroxy-benzene-ferric sulphonate, and the tri-para-amino-benzene ferric sulphonate, the formulæ of which are as follows:—



Para-amino-di-hydroxy-benzene-ferric sulphonate.



Di-para amino-hydroxy-benzene-ferric sulphonate.



Tri-para-amino-benzene-ferric sulphonate.

Tri-para-amino-benzene-ferric sulphonate, or, as it is commercially called, "Ferrivine," is a scaly crystalline substance, soluble in water, in which it forms a red solution. Ferrivine, like aluvine, is stable; it does not oxidise on exposure to air; it is acid, and therefore quickly becomes converted into the hydroxide when it comes in contact with the alkaline serum. Ferrivine is absolutely non-toxic and the same doses can be used as are advised for aluvine—e.g., 1–3 gm.

METHODS OF TREATMENT.

It would be as well now to give a sketch of the clinical value of these new drugs, and how they should be used with the already known remedies in the treatment of syphilis.

Aluvine and ferrivine act like salvarsan, in some cases with not only greater rapidity, but more effectually, in others not so well. Generally speaking, the symptoms of primary and generalised syphilis disappear within four days after the second intravenous injection. Induration in chancres and those dense, infiltrated, brownish papules are not quite as resistant to aluvine and ferrivine as they are to salvarsan; but if intramine be prescribed after the second injection, the hardest induration and the most resistant papule will have vanished inside of a fortnight. I had a case of generalised syphilis in which the papules not only did not move under galyl, but more appeared while the arsenical preparation, mercury and iodides, were being administered. Five days after an injection of intramine every papule had vanished.

In the recurrent and late stages of syphilis intramine should always be prescribed first, when the symptoms vanish in a few days. In cases of cerebro-spinal meningitis the pains disappear within 24 hours; in degenerative myelitis the subjective symptoms are often improved, and I have also seen considerable benefit follow intramine in cases of

degenerative encephalitis. I will describe a case of degenerative encephalitis treated with intramine, as it shows so well what can be done by combining reducing and oxidising remedies.

The patient was suffering from the depressive type of degenerative encephalitis; he showed no change of facial expression, would not speak, he had no control over his sphincters, and was at times violent. I prescribed two intramuscular injections of intramine, with the most extraordinary improvement—facial expression returned within a few days and the patient entered into conversation. Hoping that the condition might be still further improved, a third injection was given, with the result that the patient became worse than he had ever been. I had suggested that after the second injection of intramine a metallic compound should be administered, but as the medical man in attendance wished to see what intramine alone would do it was not prescribed. Seeing that the patient had become worse after the third injection, which was what I expected, I hazarded the opinion that if a metallic compound was given now his improvement would be sudden and greater than on the first occasion. An intravenous injection of galyl was administered, with the result that in 48 hours' time the patient became a rational individual. For how long the improvement is going to be maintained I cannot say, but this case is especially interesting to me as a proof of my theory of oxidation and reduction.

As the maximum therapeutic action is obtained in early syphilis if intramine follows the administration of aluvine or ferrivine, likewise is it the case if in late syphilis one or other of the metallic compounds follows intramine. I have treated some cases of cerebro-spinal meningitis with first an intramuscular injection of intramine, then with two intravenous injections of a metallic compound, and, finally, with mercury and iodides, with the very greatest success—so much so that I think such patients are better advised to have the treatment just outlined in preference to intraspinal injections of salvarsanised serum. Owing to the non-toxicity of intramine, aluvine, and ferrivine, serum withdrawn after their administration and injected intraspinally has a most beneficial influence upon central nervous lesions far superior to that of salvarsanised serum, and, moreover, no toxic symptoms occur, as are too often witnessed when galyl and the other arsenical substitutes are used. The following case is one in point:—

A man, aged 34, came to me complaining of double vision. He had contracted syphilis five years previously, and had been treated thoroughly with mercurial inunctions and injections before the symptoms of the generalisation stage manifested themselves. The patient had also had nine intravenous injections of salvarsan at various periods, but had never had another symptom of syphilis. On examination I found that there was a unilateral partial third-nerve paralysis, the pupils were unequal, and the reflexes were sluggish. The patient had no knee-jerks, and there were areas of diminished tactile sensation. I elicited from the patient that he had lost much weight, and that all sexual desire had vanished in the last few months. I gave three intramuscular injections of intramine, and alternated them with three intravenous injections of aluvine. After each injection I gave an intraspinal injection of the prepared serum. The cerebro-spinal fluid when first examined exhibited the typical features of degenerative myelitis, after the fifth injection it was practically normal, and by this time all the objective and subjective symptoms had vanished. The double vision disappeared after the first injection of intramine, showing clearly that the cranial-nerve lesions in degenerative myelitis must be of meningeal origin, commencing in the meninges covering the nuclei in the base of the brain.

The introduction of a reducing agent like intramine into our therapeutic armamentarium is going to have not only a very marked effect in combating syphilitic lesions, but also lesions of possibly all chronic infections. The following case will show its influence in the former:—

A medical man, aged 42, contracted a digital chancre nine months ago. In all, he had seven intravenous injections of neosalvarsan and galyl, the last two injections of galyl being given after the appearance of a big recurrent syphilitic ulceration of the right tonsil, but without any therapeutic action. The patient had taken some mercury, but rather irregularly. I gave an intramuscular injection of intramine; in a few hours the subjective symptoms in the throat vanished, and by the fourth day it would have been difficult to say that the tonsil had been ulcerated. The improvement in the general health was just as remarkable.

Cases of lupus which Dr. H. G. Adamson has treated with intramine, upon which a report will appear shortly, show its influence in the latter. I have also had some success with intramine in the treatment of chronic cases of gonorrhœa. The future alone will show what effect these new drugs are going to have upon the cure of syphilis and upon the incidence of recurrences; therefore there is no point in discussing this problem now.

Two Important Questions.

In outlining the treatment I now adopt in the various stages of syphilis there are two very important questions which arise, the correct answers to which it is necessary to find, in order that we may treat our patients in the best way possible.

1. Assuming that in the doses given the oxidising effect of salvarsan, aluvine and ferrivine are equal, is that effect going to be enhanced by giving an injection of each, or is the effect going to be the same if three injections of any one are prescribed? Theoretically, I should doubt whether any difference in effect would be produced, but whether this is the case practically remains to be seen—a point by no means easy to determine.

2. If we fail in curing a case of syphilis at once are we right in continuing treatment after the disappearance of the symptoms, or might it not be better for the patient to be treated symptomatically only? The syphilitic parasites are attacked first and foremost by the resisting substance—i.e., the lipoid-globulin molecules in the serum. The resisting substance has an oxidising and reducing action, actions which we increase by salvarsan, aluvine, and ferrivine, on the one hand, and by intramine and iodine on the other. An increase in size of the lipoid-globulin molecules, produced by the administration of the synthetic remedies just mentioned, results in a breaking down of the molecules, with ultimately a diminution in the amount of the resisting substance.

The properties of the resisting substance may be lessened, not only to below those of the resisting substance in bacterial diseases, but also to below those of the normal resisting substance. Therefore the continued administration of powerful oxidising and reducing remedies might possibly be expected to result in so little of the compound being adsorbed that their oxidising and reducing actions would be reduced to perhaps nil. Knowing that both oxidation and reduction are catalytic reactions, it might theoretically be possible that only the minutest traces of the metallic hydroxide and the di-sulphide are necessary to continue the good work. Since mercury acts mechanically and probably not as a peroxidase at all, and considering that its action is entirely dependent upon the size and adsorptive capacity of the lipoid-globulin molecules, it might again theoretically be assumed that the administration of mercury, once the properties of the resisting substance have been reduced, would be entirely superfluous.

Ever since the advent of salvarsan I have been struck by the enormous increase of cases of meningeal syphilis and the very frequent occurrence of lesions, in spite of the fact that the patient was well under the influence of mercury. I have also seen many cases in the latent stage precipitated into a condition of degenerative myelitis and degenerative encephalitis by the administration of our powerful remedies. So far as dealing with patients in the latent stage is concerned, I have for some time made up my mind never to prescribe treatment if I found no symptom after a thorough clinical examination. I have also long since made up my mind to treat symptomatically only those patients who have once entered the recurrent stage, but as to how a case in the generalisation stage should be best treated a little further discussion is necessary.

Treatment in the Generalisation Stage.

To make the subject clear I will picture the body as consisting of two parts: (1) the systemic part; (2) the nervous. The nervous part is largely dependent upon the systemic part for its resisting substance.

If the resisting substance in the systemic part has been reduced by treatment, spores which are resistant to treatment may be possibly prevented from developing if small doses of the remedy are continually being prescribed. The rule is far from being invariable. Against this one must consider the frequency of recurrences when mercury and iodides are not prescribed after a course of several injections of salvarsan, and how the protective action of mercury and iodides compares with that of the resisting substance when working alone

Systemic recurrences are far more common when salvarsan is not followed by mercury and iodides, but the frequency of the same, and as to when they appear, depend upon the number of injections given. If three or less injections of salvarsan are given the recurrences are more frequent than when six or more injections are given in one course of treatment, but they appear much later. Usually 12 or 18 months have elapsed before they make their appearance, while after a course of several injections a recurrence may appear in two or three months. Unless the individual has the opportunity of observing many cases, this somewhat paradoxical result might easily lead to false conclusions being made.

The explanation of this disparity as to the time at which the recurrences appear is as follows. When three injections of salvarsan are prescribed the resisting substance is scarcely reduced, with the result that it continues exerting its power until the parasites ultimately get the upper hand, which is hardly ever under 12 months. When several injections have been administered, the resisting substance is so reduced that the spores which have not been killed by the treatment will be able to develop on a soil which to them is the same as a new soil; consequently, symptoms will appear after the usual incubation period; therefore, two or three months later.

The early syphilitic lesions are far less dangerous and cause much less local damage than late syphilitic lesions, hence the systemic recurrences after a course of several injections are preferable to those which occur when only three injections have been given, since the former produce fewer degenerative changes, especially in the vessels, which in most lesions are primarily attacked. Therefore a course of several injections produces better results than a course of a few injections, and since the recurrences after both are fewer in number when the injections are followed by mercury and iodides, these two drugs should not be omitted in the treatment of syphilis.

As mercury and iodides can have such an infinitesimal action when the resisting substance is reduced, might it not be better for the patient after a course of several injections to wait 8 to 12 weeks before taking mercury? Eight to 12 weeks is about the time the resisting substance takes to get back to its normal state. Now mercury and iodides have nothing like the influence in altering the state of the resisting substance that the strongly adsorbed compounds have, and since both may have some power in preventing the spore from developing, it would seem wiser to allow no interval to elapse between stopping the salvarsan and commencing the mercury. As to whether mercury should be given continuously or intermittently, does not, I think, matter much. As mercury in the form of injections is more powerful than when taken per os, from the patient's point of view the intermittent treatment is the only one which is practicable.

A question which is impossible to answer is, How long should the mercurial treatment be maintained? A correct answer could only be given if we knew that a spore would not develop if it had been dormant for a certain number of years. As we know that spores may re-develop years after they have been quiescent, we are obliged to let our clinical experience guide us, and to give that amount of treatment which we have found in the majority of cases to be sufficient and that is, roughly, one year's treatment when the case of syphilis is in the primary stage, and two years' treatment in the generalisation stage.

Owing to the fact that the nervous part is dependent for its protective substance upon the systemic part, it will be readily understood that if the organisms have reached the nervous part before treatment has commenced they will be able to develop therein the more readily the quicker the resisting substance in the systemic part has been reduced. It will follow, therefore, that the incidence of cerebro-spinal meningitis will be greater when many injections of salvarsan than when a few have been prescribed. Cerebro-spinal meningitis is a curable condition and, moreover, its occurrence practically precludes the patient from getting a degenerative lesion later.

Now let us consider what happens to the nervous part if only a few injections of salvarsan are administered. The resisting substance is not strong enough to kill the parasites, but strong enough to prevent them developing sufficiently to produce symptoms. In this state the spores can migrate and do migrate into nerve tissue proper, where they meet with still less resistance, with the result that now any symptoms which appear will be degenerative in character, and, therefore, more or less incurable. Once again we see that a course of several injections is preferable to a course of only a few.

The onset of nervous lesions is naturally dependent upon the number of organisms that reach the meninges before treatment is begun. Cerebro-spinal meningitis is much more common in patients who have severe generalised symptoms than in those in which the so-called "secondaries" are slight. For all practical purposes it may be said that a ratio exists between the severity of the early cutaneous eruptions and the occurrence of early cerebro-spinal meningitis. As the symptoms of cerebro-spinal meningitis almost invariably occur between 8 and 12 weeks after the last injection of salvarsan, it is wise to give every patient in the generalisation stage an extra course of powerful treatment round about this time.

Outline of Treatment in Various Stages.

What effect the introduction of intramine is going to have upon the points just raised I am not in a position yet to say, but one thing is clear—namely, that the administration of intramine reduces the number of the long course of the metallic compounds by about half, and increases the result produced.

As iodides increase the action of intramine, possibly owing to the fact that the mercaptan-protein will react with iodine as it does with oxygen, thereby saving the free oxygen which is so necessary, and with the result that the iodine conveys it back into di-sulphide protein, I now often prescribe iodides one week before and one week after any big dose of intramine is going to be administered. The equation of the interaction is probably as follows:—

$$2R.SH + 2I = R.S.S.R. + 2HI.$$

Furthermore, iodine acts as an indirect oxidising agent, because it has the power of forming peroxide for the oxidase system, as per following equation:—

$$4I + 5H + 4OH = 4HI + 2H_2O_2 + H.$$

In the primary stage I order 30–60 gr. of potassium iodide to be taken daily, and inject intravenously a large dose of a metallic compound. Three days later I give an intramuscular injection of intramine (1–2 gm.), and between the fourth and seventh days after I inject intravenously another maximum dose of a metallic compound, and continue mercury, intramine, and iodides for one year as follows: 1. Eight fortnightly intramuscular injections of grey oil, 2–3 gr. of Hg. 2. Eight fortnightly intramuscular injections of intramine, 1–3 c.c. Mercury and intramine alternately. 3. One month in every three iodides should be given internally. The first month of iodides should be commenced after four doses each of mercury and intramine have been injected. 4. One month's rest should follow every eight injections each of mercury and intramine.

In the generalisation stage I order iodides at once, and prescribe two intravenous injections of a metallic compound both before and after one or two intramuscular injections of intramine, allowing four days to intervene between each intravenous injection. I then give four courses of the mixed mercury, intramine, and iodide treatment, and two months after the last intravenous injection I inject intravenously a maximum dose of a metallic compound before and after a large intramuscular injection of intramine, as outlined in the primary stage.

In all recurrent and late cases I first of all give one or two intramuscular injections of intramine, then one or two intravenous injections of a metallic compound, and follow up the same with one course of the mixed treatment. This treatment will also do for cases of non-degenerative meningo-encephalitis and myelitis.

In cases of degenerative encephalitis and myelitis in which more drastic treatment might be expected to give more satisfactory results I give the following:—1. An intramuscular injection of intramine 2. Four days later an intraspinal injection of prepared serum which has been drawn off on the third day. 3. Three or four days later an intravenous injection of a metallic compound. The metallic compound should not be galyl, kharsivan, neo-kharsivan, or any of the other French substitution-products for salvarsan, as they are too toxic. 4. Three days later an intraspinal injection of prepared serum, which has been collected the day before. The injections of the non-metallic and metallic compounds should

be continued alternately, until the cerebro-spinal fluid is normal or approaching close thereto.

Women who are pregnant should be treated as first described under the heading of the generalisation stage, and two courses of the mixed treatment should be given without any pause in between. The extra injections at the second month are unnecessary.

Congenital syphilitics should have the mixed treatment for two years, with the exception that the mercury should be administered per os and continuously. All recurrent symptoms should be treated symptomatically and intravenous injections prescribed if practicable, as suggested in recurrent and late cases of acquired syphilis.

As intramine is a new drug, some points with regard to its administration might with advantage be given. All intramuscular injections are apt to be painful; the intensity of the pain varies with different individuals, and is mostly due to the bulk of the injection and the œdema and contraction of the muscle fibres which follow it. There are several ways in which the pain can be reduced. First and foremost, the intramine should be well warmed before it is injected. Immediately after the injection pain is experienced; this lasts for a few minutes, then vanishes, to reappear some hours later when the œdema and contraction set in. The patient should be well massaged after the injection has been given; he should walk about to aid absorption, and the moment the stiffness begins to set in he should have a very hot bath in which some soda has been dissolved. For the next two or three days the leg should be moved as much as possible, hot baths should be repeated, and the part should be well massaged. By the fourth day every trace of intramine will have vanished from the buttock, no induration will remain, and the patient should be able to move about in the normal way. There is usually a rise of temperature on the second and third days, the degree depending upon the severity of the case; the patient may perspire freely, and sometimes a few days later an erythema appears over the injected buttock, which either remains localised or spreads over the body, in every case to disappear 24 or 48 hours later. The erythema is probably due to the sulphur. However big be the dose, and however frequently it be repeated, I have never noticed any other ill-effects than those already described; therefore it may safely be assumed that intramine is an entirely innocuous drug.

CONCLUSION.

I cannot help closing my lectures with the prophecy that intramine, especially when alternated with powerfully adsorbed oxidising agents, is going to play a very important part in the treatment not only of syphilis but of all chronic infections, since it has already proved itself to be of considerable value in cases of tuberculosis and chronic gonorrhœa. It is even probable that intramine may have a place in the treatment of malignant disease.

Finally, I must express my very deepest gratitude to Mr. J. Ernest Lane for the way in which he has facilitated my work at the Lock Hospital. I must also thank Mr. J. Patterson, Mr. R. L. Mackenzie Wallis, and Dr. H. Spence, for their invaluable assistance, and the British Drug Houses, Limited, for the help given and interest taken in my work.

PETROL FOR DOCTORS IN IRELAND.—Owing to the proclamation of martial law, all the petrol in the country was commandeered by the military. As a result, medical practitioners have had to get permits from military officers to obtain petrol, and every effort has been made by the authorities to allow them as little as possible, forgetful of the fact that no profession has been doing so much war work for the country as the medical, and that many are away at present at the front. It is a great pity that the arrangements necessary to control the petrol-supply were not left in the hands of practical business men, who could appreciate the difficulties of the situation, and act accordingly.

EAST-END MOTHERS' LYING-IN HOME.—The report of this charity for the year 1915 was submitted to the annual meeting at the Home, 394-6-8, Commercial-road, Stepney, E., on May 17th. The report states that among the in-patients 549 women were delivered, 539 children being born alive. There were 15 still-births, 10 sets of twins, 5 miscarriages, 111 premature births, with deaths in 13 cases before leaving the Home. The special day and night calls attended to in the district numbered 145, and among out-patients 1166 women were delivered with 1138 infants born alive, 35 still-births, and 20 sets of twins.

NOTES ON A CASE OF SYPHILIS OF THE AORTA.

BY SIR CLIFFORD ALLBUTT, K.C.B., M.D. CANTAB., F.R.C.P. LOND.,
REGIUS PROFESSOR OF PHYSIC, UNIVERSITY OF CAMBRIDGE, ETC.

With Pathological Report by HUBERT M. TURNBULL, D.M. OXON., ETC.,
DIRECTOR, PATHOLOGICAL INSTITUTE, LONDON HOSPITAL.

ABOUT six months ago I happened to be present in Addenbrooke's Hospital at the necropsy of a man, aged 33, whose death was due to chronic syphilitic meningitis (pia-arachnitis). The Wassermann reaction had been positive. To the naked eye the thoracic and abdominal viscera seemed to be normal. The prosector (Dr. Aldren Wright) at first passed, as I did, the heart and great vessels as normal. But on concluding the inspection it occurred to us that a closer examination should be made of the aorta. The heart and the few inches of the great vessel still attached were then carefully re-examined. But again, on a cursory view, and in the fresh state, these parts seemed normal until Dr. Wright so supported them in their proper position that they could be inspected within and without; then we became aware that the first portion of the arch was a little dilated. A slight but definite, rather irregular bulging was visible within and without. When the parts collapsed this bulge was scarcely manifest; at any rate, not obvious. Furthermore, on yet closer inspection the inner coat of the vessel was seen to be not quite normal, even to the naked eye. In colour and continuity it was unaltered, but inside the dilated portion the lining membrane, over an area about the size of a shilling, seemed a little granular or finely pitted.

The arch was therefore removed and preserved, and sections of it were made. When the vessel had been stiffened by the preservative fluid the dilatation became more fixed and obvious, and on examination of these sections microscopically I was so much impressed by the appearances that—in the shorthandedness of our pathological department, and the absence of Professor G. Sims Woodhead himself on military service—I sent the sections, and afterwards the heart and portion of the aorta, to Dr. Turnbull, with whom I happened then to be in correspondence. His letters I append in full, as they illustrate, what I think we have not on record, a syphilitic aortitis caught at an early stage; or rather perhaps during a very chronic attack which, whatever its duration, had progressed very slowly. For a description of the Hodgson-Welsh aorta, afterwards described by Döhle, Heller, and others, I may venture to refer to my recent work on "Diseases of the Arteries."

In the present specimen I would draw especial attention to the entire absence of atheroma, taking this term in the sense of Jores's sub-intimal changes, with splitting of the elastica, an absence which is the more striking as in advanced cases atheroma commonly, indeed usually, supervenes, and although distinguishable from the syphilitic process blends with it. The description of the blood-vessels also is interesting. To a true hypertrophy of the intima Dr. Turnbull has drawn attention before.

From this case let us draw the lesson in all necropsies on syphilitic cases to submit the thoracic aorta, and especially the ascending arch, to minute scrutiny, to section and microscopic examination. In current necropsy work this aorta might well have passed unnoticed; and had the patient suffered from angina pectoris we should have been assured that the aorta was intact.

Pathological Report by DR. H. M. TURNBULL.

(1.)

I have examined the two transverse sections of the aorta which you sent me. I am much averse to expressing an opinion on sections which are stained by one method only, but if only one stain is employed the van Gieson method is certainly the best.

The *adventitia* is abnormally broad and dense. In one section this alteration in the adventitia contrasts sharply with the adventitia of a portion of relatively healthy aorta, at one side of the intimal thickening. In one section there is some perivascular infiltration, round a vessel which passes from the adventitia into the media.

The *media* shows extensive fibrosis, and in this respect contrasts sharply with the slight fibrosis in the relatively

healthy portion of the vessel. In part of the fibrosis the collagen fibrils are directed normally, but in the greater part of the fibrosis, particularly in one section, the collagen fibres are directed at angles, even right angles, to their normal course. The increased vascularity of the media is very marked. Round these vessels there is seldom any cellular infiltration, but dense fibrosis is frequent. The elastic has been destroyed in patches. There also appear to be patches of degenerate swollen elastic. Fibrosis of the outermost layers of the media fuses with the fibrotic adventitia. In one section the preparation is, unfortunately, folded over a portion of media in which more active changes appear to be present.

Only one vessel is present within the thickened intima. The thickened intima is certainly degenerate, but numerous muscle fibres are still present. These fibres are very regular in arrangement; the great majority lie in the long axis of the aorta. There is no area of pultaceous (true atheromatous) degeneration in the intima.

The great vascularity of the media, the abnormal arrangement of the bulk of the collagen fibres in the fibrotic areas of the media, the perivascular infiltration, and the focal fibrosis of the adventitia all bear witness to an inflammatory reaction, and a reaction of considerable intensity. Such a reaction might be secondary to the irritation of products of degeneration. There are indications in the sections that special stains would have shown some calcification of the media, but there is no evidence that medial calcification was of a degree sufficient to stimulate such a reaction. Calcification of a degree sufficient to cause so much inflammation would have been obvious, even in the sections prepared as they have been. Further, degeneration of the media would not have led to permeation of the intima by vessels. The degree of degeneration in the intima is very much less than that which is found to stimulate vascularisation and infiltration of the media and intima.

I think, therefore, that there can be no doubt that the inflammation of the adventitia and media is primary. The inflammation is of a very chronic sclerosing type, and there is little evidence of present activity; the inflammatory tissue is chiefly dense collagenous scar tissue; young, infiltrated granulation tissue is scanty. Further, apart from the one vessel in the outer part of the intima, there is no evidence of inflammation in the intima. The intimal thickening does not consist of granulation tissue, but is a degenerate thickening which has contained muscle fibres arranged definitely, for the most part longitudinally. The intimal thickening has the appearance of a musculo-elastic hypertrophy which has undergone degeneration.

I take the specimens to be examples of a very chronic syphilitic inflammation of low intensity, in which the inflammation has been almost confined to the adventitia and media. It is in such cases that one finds, as I think here, a hypertrophy of the intima over the inflamed, and, therefore, weakened media, instead of an inflammatory thickening of the intima.

In this diagnosis I have not been influenced by your intimation that the patient had had syphilis. I should, in view of the histology, have put my money on a positive Wassermann even had there been no other lesion in the body and no history.

London Hospital, Dec. 7th, 1915.

(II.)

I received the heart and aorta, and two sections of aorta, safely. I have given instructions for their return.

The sections appear to be from the same blocks as the previous pair, which I diagnosed as syphilitic.

The ascending aorta and the arch, from the commissure to the origin of the left subclavian artery, are without doubt affected by syphilitic inflammation. It is a beautiful specimen, and shows (1) the confinement of the lesion to one portion of the aorta (macroscopically), and in this affected portion (2) diffuse dilatation; (3) focal pouches and numerous sulci; and (4) the very characteristic, widespread, white, succulent thickening of the intima.

I can see no evidence of inflammation of the aortic valves. There is very little constriction of the orifices of the coronary arteries.

London Hospital, Dec. 24th, 1915.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—A Comitia was held on May 11th, Dr. Frederick Taylor, the President, being in the chair. The following Members were admitted to the Fellowship, having been elected at the previous meeting: Dr. M. G. Foster, Dr. J. M. Hendrie MacLeod, Dr. H. L. McKisack, Dr. C. H. Miller, Dr. H. W. Wiltshire, Dr. C. E. Lakin, and Dr. E. A. Cockayne. A communication was received from the Society of Members of the Royal College of Surgeons of England. The President then dissolved the Comitia.

THE TREATMENT OF HEAD INJURIES IN A CASUALTY CLEARING STATION.

BY ALEXANDER DON, M.B., C.M.ABERD., F.R.C.S. EDIN.,
MAJOR, R.A.M.C. (T.)

THIS paper is based on a series of over 150 cases operated on since the war began, and most of them in a Casualty Clearing Station. Much has already been written on the subject, but there still remains great divergence of opinion as to the best mode of treatment, and especially as to the place where this treatment should be carried out. In France, for the past year at least, casualty clearing stations have occupied a somewhat anomalous position owing to the effect of trench warfare on their mobility. They have taken the place of stationary hospitals, less adequately equipped, perhaps, than the units going under that name, as the necessity for being able to move quickly must always limit their equipment. But the better opportunity for dealing with the more urgent cases of serious injury in a quasi-fixed unit has afforded the specialist in surgery in a casualty clearing station an experience he has not hoped for and which has made the work more interesting than that in any other medical unit. Most of the patients are birds of passage, and even head cases do not remain long enough for a final decision being arrived at as to the value of the treatment, but the serious cases have been kept in this station till they have either succumbed to their injuries or have got over the immediate danger of shock, and are sent down usually sufficiently well to take an interest in life again.

An X ray installation would be a great acquisition in dealing with such cases, and it has been argued that they should not be touched in its absence, but the difficulty in moving such an apparatus has to be considered as well as the danger to the patient of not relieving urgent symptoms. With the knowledge of the size and position of the missile which a radiogram affords the surgeon, better and more satisfying work could undoubtedly be done, but this is not a sufficient reason for passing all head cases hurriedly through to the base. An operation to remove the foreign body has often to be planned from altogether another avenue of approach than the entrance wound. The external, or scalp, wound, the injuries to cranium, dura, meninges, and brain, all require early attention to prevent sepsis and other immediate bad effects, and this can be given with better results, because earlier, at a casualty clearing station than will be possible at any later stage. Still better results might be attained nearer the front by symptomatic treatment; but, on the other hand, less time is given for symptoms to develop which may guide the surgeon as to how far operative interference is likely to benefit the patient.

Nor is it desirable to convert even a portion of a field ambulance into a hospital suited for major operations. But that is a matter for others to decide upon—C'est la guerre—and we must do our best for cases as they reach us. Head cases, I find, travel badly in motor ambulances, especially in winter. This is not to be wondered at. Much depends on the driving and on the state of the roads. Speed may be a desideratum in cases of severe hæmorrhage, but it adds much to the shock both in penetrating wounds and in simple concussion. The shock from the missile itself is often apparently trivial. I have known a man to steer his aeroplane for 30 miles after being hit, to walk afterwards into hospital, and to die suddenly three hours after admission. In flying there is comparatively little vibration. The running of the engine in a stationary plane or motor-car is specially irritating, but this vibration is not felt when the vehicle is in motion. A post-mortem examination in the case of the airman referred to disclosed multiple hæmorrhages and œdema throughout the brain and in the pons, yet the man showed no signs of head injury or shock to the casual observer. A long drive in an ambulance nearly always means serious collapse if the patient is lying, while sitting cases do not seem to suffer much from the journey. Thus it is that among patients with head injuries admitted to the hospital there is no middle class. The lying cases are nearly all unconscious, while the sitting cases walk in as if there were little the matter with them. It is the old experiment of the effect of a series of repeated small blows on the head in producing concussion or shock. Many of the lying cases recover

consciousness quickly after admission. They are at first cold, pale, and dazed, but after a couple of hours of rest they get warm and are fit for operation.

There is no contra-indication to immediate treatment in these cases as a rule. Some of the lying cases do not improve, but go steadily downhill. They are really moribund on arrival, though the end may not be yet awhile, and they are better left alone. I have operated on quite a few almost without an anæsthetic, but I have rarely seen any improvement follow operation if the patient did not react to what one might call intelligent nursing on admission.

In the majority of the unconscious cases from two to four hours will suffice to combat the shock of the journey, for the jolting does not produce gross lesions. They are then taken to the operating theatre and the wound cleaned as far as possible to prevent the spread of infection.

Operation.

The scalp is cleaned of all dirt, blood, and hair, either by washing and shaving, or preferably by a depilatory. In theory the whole scalp should be done, but in practice and with the military table with no head-rest it is sufficient to clear an area of two inches all round the wound. A sterile towel is then fixed by clips half an inch to the inner side of the edge of the prepared area, and through this space all operating is done. Iodine is painted over the scalp, and the wound is excised freely, leaving an edge which appears perfectly undamaged to the eye. This is best done with a scalpel by making two elliptical incisions down to the bone and enclosing the wound. Further incisions may now be made in the same line or at any angle, but only sufficient scalp should be opened to give a perfect view of the skull below the entrance of the missile. The skull is examined and further interference decided upon from its appearance and from previously observed symptoms. Where there is no obvious injury to the bone and no cerebral indications for opening it, the scalp wound is immediately and completely closed, and healing by first intention is the rule.

Where the skull shows signs of injury, or where cerebral symptoms show need for trephining, this is done. A trephine hole three-quarters of an inch in diameter is made at the side of the opening or fissure, and the dura is examined. The edges of the trephine opening are nibbled away to any desired extent, and if no blood clot lies underneath, or if there is no opening, nothing further is done. In the presence of subdural clot or penetrating dural wound the dura is slit up, and blood clot is removed and any bony spicules that are easily detected. Pulsation should then be free. Extensive probing with either a metal instrument or a catheter will usually reveal nothing further and may do damage, and finger probing is no more sensitive and much more destructive. The only indication for touching the brain is knowledge of the position of spicules of bone or metal or to relieve pressure from intracranial blood clot. Foreign bodies or bony spicules if sticking in the dura or felt just under it may be removed, and blood clot generally oozes out if the brain is gently depressed away from the dura all round the opening. The position of the missile can as a rule be determined safely only by a radiogram.

At the beginning of the war I used the flap operation for the scalp and excised a big piece of cranium by Vilbiss's forceps, but the exposure obtained is no advantage in a casualty clearing station, and the operation is more severe and more spectacular than is necessary. The flap incision also in some degree interferes with any future operating through the same or a bigger cranial opening, though this difficulty is surmountable if the radiogram should show this to be the nearest and best point from which to remove the missile.

Almost all shell wounds are followed sooner or later by cerebral abscess from in-carrying of hair and dirt to the brain, but there are no means of deciding which cases will form abscesses and which will not. Generally speaking, and this is borne out by experience, rifle bullets which enter point first and make a clean wound may be considered as innocuous, for a time at least, so far as sepsis is concerned. Their ultimate effects have not yet been definitely determined, but from the number of cases already reported as healed or recovered, and from the paucity of re-evacuations of such wounds from the front, as compared with those previously wounded in other parts of the body, it is fairly well established that the soldier with a rifle bullet lodged in his brain is *hors de combat* for this war, and that all such bullets should be removed in home hospitals. This is a work for brain specialists, for those alone who have acquired skill and dexterity in this field of surgery. It would surely be a simple matter to have three or four small hospitals throughout Britain specially equipped for this work. At present a surgeon may advise no interference, if he cannot perform the operation with confidence himself, and who can blame him for not attempting what he feels he is not qualified to perform?

Pieces of shell come under another category. Most of these will give trouble earlier from abscess formation, and the choice of the operating surgeon at present is between letting such patients die or opening the abscess and removing the peccant morsel of shell. This is a much simpler problem, for the life of the patient is at stake, and being an urgent operation, it must come within the scope of the specialist in surgery in every hospital where an X ray installation is available. No septic wound can heal if there is a foreign body in it; it matters not what part of the body is concerned. The brain is no exception to this general rule. We must remove the foreign body ere healing will begin. Few casualty clearing stations possess an X ray installation, and for that reason only very urgent cases of abscess will remain there for operation. It is wiser to send all penetrating wounds of the skull to the base hospitals as soon as they are fit to stand the train journey. The only advantage of doing anything to head cases—and it is a great one—in casualty clearing stations is that a majority of them present urgent symptoms which may be relieved and that the wounds are not yet grossly infected, and healing takes place by first intention after excision. Fear of opening the dura mater should never prevent a surgeon from doing what is necessary for his patient. He must not "funk" the necessary treatment for fear of criticism if urgent symptoms indicate its advisability. It is the patient's only chance, and a day is lost by transferring him to the base. The damming-off of the meningeal space is a well-known early if uncertain occurrence, but it is in no way comparable to the formation of peritoneal adhesions. It is a very limited process, and the subarachnoid space must be opened at any future operation, when a spreading general meningitis is likely to be much more serious. I have never understood the rationale of vaseline and other similar applications which I have seen used to dam off spaces or to prevent adhesions. They are unsuitable, as from the first they act as foreign though sterile substances, and they can never mix with the cerebral fluid or the blood serum.

I have been privileged to see some of the brain work both in English and French hospitals since the war began and to compare the results obtained. In the English units the huge scalp flap and large cranial opening are the rule, and the operation to reach the dura is a tedious, serious, and bloody one. I have seen an English surgeon stop and not open the dura, where intracranial pressure symptoms were the sole reason for an operation, and I thought he acted wisely in not proceeding further in view of the patient's condition and the time already spent. In the French hospitals the linear or angled scalp incision and small trephine opening are the vogue, and I am bound to say their results are better than ours. This is borne out by published statistics, so far as I have been able to examine them. Naturally my own experience is limited, but the desire of the soldier in the new armies when he first goes into the trenches to get a look at the enemy has led to a comparatively large nnmber of rifle bullet wounds of the head. It is the sniper's opportunity. The high-explosive shell also caused a number of head injuries previous to the adoption of the useful steel helmet. Bombing accidents at practice are also fairly frequent. In quieter times all these cases have received first treatment, and I am convinced that the minor operation I have lately practised is the more beneficial. The patients are seldom any more collapsed after a head operation. The scalp incision causes little shock, and the trephining and nibbling practically none, and if opening of the dura is indicated there is often marked improvement from relief of pressure. The removal of depressed bone is also of great benefit.

The indications for operation are three: (1) The presence of a penetrating wound of the head; (2) the fitness of the patient to take a general anæsthetic; and (3) a surgeon with some experience in cranial surgery. The first two are fairly definite. The third is the crux, and here, as in most

matters in surgery, the operator is a law unto himself. If he finds his patients do badly after operation he should abstain from interfering. He alone can judge, but he may not draw the conclusion from this that operative interference on the part of others is a mistake. To tinker with scissors to trim the edges of the wound in the scalp, to remove an unnecessarily large piece of cranium, to open widely the dura mater to allow him to poke his finger into the brain, are all detrimental at the time, and the future advantages to the patient must be great to warrant such. But to remove the dirt from the scalp wound by a clean cut, to open the cranium just wide enough for the extraction of pieces of bone pressing on the dura or sticking into the brain, to allow the escape of blood clot and pent-up brain débris, and to restore pulsation, involves slight shock, takes a minimum of time, and gives excellent immediate results. Primary healing is the rule, hernia of brain the exception.

Drainage.—At first I drained all cases with tubes, stuck even into the brain opening, from a fear of infection by gas and other organisms. Gas infection is rare in head wounds. These saprophytes thrive only in dead tissues, and consequently only in the graver lacerated wounds of the head, and these are usually rapidly fatal. A cellulitis, almost erysipelatoid in appearance, is not uncommon, especially in wounds of the frontal region, but it is rarely extensive. Tubes do not drain deep sinuses in brain tissue till abscess has formed and the walls are lined with granulations, as they become quickly blocked by blood-clot and brain débris. It is better to drain superficially with a small piece of rubber dam, which is removed at the first change of dressing.

In a clearing station one cannot treat all head cases. In a rush after an attack this would be impossible, and many cases have to be passed on after a change of dressing. At such times one reckons patients by the standard of their relative fitness to be safely sent down by train, and only the worst cases are retained for treatment. In normal times of comparative quiet I have treated all the head injuries on the above lines. The patients are then sent to the base as soon as they are fit to travel with safety, whether the stitches have been removed or not. A few herniæ cerebri have been controlled by bridging. Bone has in no case been replaced. Fits supervened in one case after bridging, and were relieved by readjusting the dressing, and in another case by a second operation to relieve pressure when the dura had not been opened. The deaths after operation amount to a little over 9 per cent., and some of these were hopelessly bad on admission.

Some Typical Cases.

CASE 1.—2050, Private ——, admitted at 6 P.M. with shell wounds of arm, leg, and hand on right side. Some twitching of left arm and leg. He had a long, lacerated wound running horizontally along the upper part of the right parietal bone. Partial paralysis of left leg. Pulse 99, temperature 102·4° F., respirations 25. Quite unconscious, cold, and collapsed. Next morning pulse 130, temperature 103°, respirations 32. Now complete paralysis of left leg. Operation 11 A.M. Wound excised and two angular incisions made to form a flap. Vertical fracture extending whole depth of flap and beyond. Slight horizontal scar on bone. ¾ inch trephine opening at lower edge of scar. An area of cranium 2½ inches by 1½ inches removed with Vilbis's forceps. No extradural clot or perforation. Dura bluish-black in colour. Opened by crucial incision and a blood clot enough to fill an egg-cup removed. Drain across dural opening, and wound closed. Third morning: Pulse 99, temperature 100·6°. During night following a good deal of twitching of left side. Fourth day: Only muscles supplied by left facial showed clonic spasms. Temperature 98·4°, pulse 90. He recognises ward orderly and sister. Does not speak, but calls out when leg and arm are being dressed. These wounds are very septic. Head wound clean. Transferred to base eighth day greatly improved. I think immediate operation was here justifiable.

CASE 2.—2279, Private ——. Lacerated wound left side 2½ inches in length, centre just above ear level. Pulse 70, temperature 97·8° F. on admission. Fairly conscious, but slow in expressing himself. Second day: Not so well; pulse 116, temperature 101·5°, respirations 28. More dazed, and roused with difficulty. The wound was excised. In skull, small irregular wound ¾ inch by ½ inch blocked by blood clot. A ¾-inch trephine opening made above and depressed bone removed and edges of shell wound snipped away. No pulsation. The dura was opened by an oblique slit 1 inch in length, including the small entrance wound. About 1 ounce of blood clot and brain débris came out. Pulsation now good. Wound closed with split drain down to dura. Third day: Pulse 64, temperature 99·4°, respirations 24. Bowels opened with calomel. Fifth day: Pulse 60, temperature 98·6°. Recovered consciousness to great extent. Sent to base next day. Scalp wound clean.

CASE 3.—18345, Private ——. Shell wound left side and back of head. Entrance wound small, 1 inch above and behind top of ear. Exit wound on postero-lateral aspect of occipital bone on same side. Very ragged and edges everted ¾ inch in diameter. Free bleeding, patient collapsed, cold, and unconscious. Pulse very rapid and feeble. Operation one hour after admission, owing to hæmorrhage persisting and free escape of brain débris. Patient still drowsy, but conscious. A horseshoe incision was made between the two wounds, which were excised. The cranium between the wounds was shattered into fragments, one loose piece being 3 by 1½ inches. Brain much lacerated and oozing through the torn dura. Very free hæmorrhage, which was controlled by ligature and hot water. A split drainage-tube was opened out and placed flat across the gap in the dura, and the scalp wound closed except behind where tube protruded. Second day: Unconscious. Urine and fæces passed in bed. Pulse 108, temperature 98·4° F. Third day: Conscious and able to talk. Still free discharge, blood and brain matter. This continued and became purulent, with hernia cerebri. Hernia shaved off, when a large amount of pus escaped. He died two hours after being returned to bed.

Necropsy.—Injury to brain running downwards and forwards from posterior wound to region of left Gasserian ganglion, where a piece of shell was found. The second wound must have been caused by a splinter of bone, as no second piece of shell was found. This case would have been better left alone, but record on card showed gunshot wound, and the two wounds suggested entrance and exit.

CASE 4.—2760, Private ——. Rifle bullet wound right side, running along direction of Rolando's fissure for 2 inches, beginning above 1 inch from the midline. Not quite unconscious. Came down lying. Recovered consciousness, and got warm after being in hospital two hours. Operation was done then. Small furrow fracture along Rolandic area. A trephine opening made at lower end and depressed bone removed. The dura was not opened, as there was not much discolouration. Wound completely closed. Next day he complained of "pins and needles" in left arm and hand. Third day: There was complete paralysis of left arm and tremor of upper eyelid. Pulse 82, temperature 100·2° F. He remained in same condition till evening of fifth day, when he said he felt better, and could move his fingers. He sat up when orderly's back was turned in the evening, and a fit ensued with left deviation of the eyes. As he continued unconscious and having spasms, he was again taken to the operating theatre, dura opened, and a small clot removed from underneath it. The fits did not return, but again he had the sensation of "pins and needles," which left him after three days entirely. He went to base on twentieth day, having regained the use of his arm completely.

The dura should have been opened at the first operation.

CASE 5.—12351, Private ——, admitted in early morning with a wound 2 inches above and 1 inch in front of right ear. Ragged and ¾ inch by ½ inch in size; shell wound. Very collapsed, cold, dazed, but conscious. Pulse 106, temperature 100° F., respiration 20. Recovered towards mid-day. Pulse 84, temperature 99·6°, respiration 20. Some swelling round wound and escape of brain débris and blood clot. Operation 5 P.M. Elliptical incision obliquely, excising wound. Piece of shell found sticking in bone with small opening at its lower side. Trephine opening below. Inner table splintered; some fragments removed. About a dessertspoonful of débris of brain and clot escaped through a small hole in dura. Dura not opened as no clot was visible through it round the puncture. Rubber dam put in and wound closed. Second day: Temperature normal, pulse 68, respiration 24. No further symptom of note till he left hospital on seventh day.

CASE 6.—2967, Private ——. Rifle bullet at hair-line above right eye, passing in downward direction. No exit wound, but bleeding from mouth and nose. Came in as sitting case, and quite conscious and fit. Taken to operating theatre one hour later. Wound excised and cranial splinters removed, leaving an opening in skull ¾ inch in diameter. Wound of exit found in hard palate. Pulse 100, temperature 101° F. on third day, which was highest. He was conscious and remembered that his upper plate of teeth was lost at the time of the injury. Temperature normal and pulse 76 on fifth day. Wound clean. Went to base sixth day, quite fit, and face wound quite healed.

CASE 7.—Lieutenant ——, age 21. Admitted 10 P.M. with multiple small grenade wounds over front part of head and face. One penetrating wound 1½ inches above root of nose. Right eye destroyed. He was very irritable, but conscious, though difficult to rouse. The eye was excised by Lister's method. Several wounds excised, but only one found with penetration of cranium as above stated. About a score of wounds over brain area, but mostly small. Second day:

Still irritable. Pulse 102, temperature 101° F. Eye dressed and looking well. Face much swollen. Third day: Pulse 95, temperature 100·6°. Irritable and refused aperient. About a teaspoonful of thin fluid escaped from puncture on brow when dressing was taken off. Fourth day: Took calomel, but refused mag. sulph. later. No movement of bowels. Lies with head covered and on right side. Sent to base on fifth day. There was evidently a good deal of cerebral irritation, and he will probably not do very well.

CASE 8.—Lieutenant ——, admitted 12 P.M. in fair condition, drowsy but conscious. Gunshot wound forehead. Entrance wound small, 1 inch above root of nose. Exit wound right side above attachment of ear. Right eye destroyed and soft. Angular incision made excising wound and running along supra-orbital ridge to external angular process of frontal bone. Whole upper wall of orbit detached downward and almost loose. Pieces of bone removed. Eye excised and rubber dam drain at external end of skin wound. Wound above ear excised. There was much laceration of right frontal lobe. Second day: Conscious. Pulse 88, temperature 99·6° F. Complains of headache. Eye dressed. Wound in forehead clean. Sent to base sixth day, conscious and feeling pretty fit.

CASE 9.—Sergeant ——, admitted 2 A.M. unconscious, cold, and very collapsed. Wound over vertex, half an inch to right of middle line and over the parieto-occipital fissure. Bandages very blood-stained. Dressed and kept warm. 4.30 A.M. operation. Wound excised and extended transversely across scalp both ways. Large hole ½ inch by ¾ inch close to the longitudinal interparietal suture passing inwards to left. Trephine opening made to right of wound. Depressed bony splinters removed. One large piece was sticking into longitudinal sinus and its removal was followed by free and persistent bleeding. Plugged with gauze, and wound closed over a piece of rubber dam covering the outer side of gauze. Several other wounds of right side and back, one large of right shoulder dressed. Patient very bad at end of operation. Same evening, pulse 70, fairly strong, temperature 101·4°, respirations 30 and stertorous. Fairly conscious. Second day: Still much the same. Head wound not dressed but other wounds dressed and looking fairly clean. Pulse 90, temperature 100·5°, respirations 26, and quiet. Taken some nourishment. Third day: Gauze plug removed. No bleeding. Wound dressed. Pulse 86, temperature 101° in evening. Conscious and looking well. Was sent to base on fifth day.

This is the only case where the longitudinal sinus has been badly torn, but in several cases there has been free bleeding suggesting injury to lateral and occipital sinuses. All cases have been plugged with dry sterile gauze which has been left in for 48 hours.

Summary.

1. All scalp wounds should be completely excised as early as possible.
2. Where cranium has been injured or there are cerebral symptoms suggesting intracranial pressure the trephine should be used and the dura opened if necessary.
3. Drains into the brain tissue are useless in early wounds and are probably detrimental to brain tissue.
4. No probing of any kind should be done in absence of a radiogram showing missile.
5. Early movement of cases of head injury in motor ambulances causes considerable shock to lying or stretcher cases.
6. The mortality in cases reaching a casualty clearing station 15 to 20 miles behind the firing line will be about 1 in 10 if every case not moribund is operated on for urgent symptoms only.
7. All pieces of shell and bullets sooner or later cause brain trouble, and should be removed in specially equipped hospitals.

NOTIFICATION OF INFECTIOUS DISEASE: THE PROPOSED REDUCTION OF FEE.—At a meeting of the medical men of Gorton, Manchester, the proposal by the Local Government Board to reduce the fee for the notification of infectious diseases was discussed and the opinion strongly expressed that such parsimonious action was dishonourable and ungrateful, particularly at the present time, when extra and heavy calls have been made upon the medical profession for voluntary and charitable work, such as attending the wives and children of soldiers and sailors, signing many thousands of certificates per week for those unable to attend at the post-office to draw their weekly pay. The heavy work of attending to the private and panel patients of those doctors who are serving in the forces, the increase in the price of drugs and chemicals, and the enhanced cost of professional living made the action of the Local Government Board, it was held, very wrong.

TWO CASES IN WHICH THE LATERAL VENTRICLE WAS OPENED

IN THE COURSE OF OPERATIONS FOR THE REMOVAL OF A BULLET AND INDRIVEN BONE FROM THE BRAIN.

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THE extreme fatality that follows the opening of a lateral ventricle during an operation for the removal of a foreign body, whether a bullet, shell fragment, or depressed bone, makes perhaps this record of two cases in which recovery followed the operation justifiable.

In about 200 cases that have come under my notice there have been some half-dozen cases where after the removal of the foreign body cerebro-spinal fluid has been found escaping from the depth of the wound, either at the operation or during the dressings some little time after the operation. In these cases the marked infection present had compelled an operation to be undertaken, although X rays showed the likelihood of the ventricle being involved, and, further, this marked infection had reluctantly compelled one to leave in a drain. These patients mostly died from cerebral hernia following infection of the ventricle and basal meningitis, but one died from extreme emaciation and wasting due directly to the persistent escape of cerebro-spinal fluid from a fistula that connected the lateral ventricle with the scalp wound. In view of this high mortality I ventured in the following two cases to depart from the general rule in early cases of always draining the track after the operation for the removal of foreign bodies or depressed skull fragments which were embedded in the brain. In these two cases the signs of sepsis were absent or slight, and so I felt justified in taking the risk of leaving a possibly infected track of the brain undrained to the risk of establishing a cerebro-spinal fistula. Fortunately, this procedure was justified, and either the wound was not infected or probably the patient's tissues were able to overcome the infection that was there. Unfortunately, in the vast bulk of wounds of the head where missiles or fragments of bone are embedded in the brain marked sepsis is only too obviously present, and a fatal result is very likely to follow when the ventricle is unavoidably laid open at the operation. Both the cases occurred at a base hospital in France, where the head cases were usually very severe and the wounds heavily infected.

CASE 1.—The patient was admitted to hospital on August 28th, 1915. No history was obtainable. There was a small penetrating wound 2 inches behind and 1 inch above tip of the right pinna. Temperature 97° F., pulse 56. The patient was restless and would not speak, his face was congested, and the respirations were slow and shallow. He was able to move. There was no paralysis of face, limbs, or tongue, and the reflexes were normal except for a diminished abdominal reflex and a doubtful Babinski. X ray examination showed a rifle bullet embedded in the brain opposite the wound, and this was localised to be with its point at about the middle line. On the 31st the patient was worse. There was more unconsciousness; the pulse-rate was 50 and the temperature was 97°; and the breathing was stertorous. Operation was decided upon.

Operation.—A large scalp flap was turned down and a small hole in the skull was exposed. A small trephine hole was made in the skull, and the bone round the wound was removed with the forceps. A small opening, too small to take the little finger, was found in the dura, and the brain beneath the dura was felt to be under extremely high tension. The bullet could be felt with a probe at a depth of 6·5 cm. The cerebral tension was relieved by lumbar puncture which showed the cerebro-spinal fluid to be blood-stained. After slightly enlarging the opening in the dura the end of the bullet was grasped by a pair of forceps and the bullet was removed. A gush of cerebro-spinal fluid and disintegrated brain matter now escaped from the wound in the brain, and the fluid continued trickling away during the rest of the operation. The tension of the brain fell markedly. The wound in the scalp was floored by a flap cut from the pericranium and the scalp flap was sutured. No drain was left in. On Sept. 1st the temperature was normal. The patient was more conscious, there was no draining of fluid from wound, and no bulging of the flap. Lumbar puncture was performed, and 10 c.c. of blood-stained fluid were withdrawn. Headache was present.

On the 3rd the patient was more conscious and had commenced to speak, and the headache was less. There was a boggy swelling of the side of the scalp under the flap, and this swelling extended to the side of the face. The eyelids were markedly œdematous and almost transparent from the fluid in them. Temperature normal. The fluid was thought to be of cerebro-spinal origin, which had escaped from the lateral ventricle along the bullet track and was collecting in the tissues of the scalp and the face. There was no escape from the bullet or operation wounds. This swelling gradually subsided, having lasted for about a week. On the 11th the patient was quite bright. The pulse-rate was 80 and the temperature was normal. There was no weakness, and except for some slight affection of speech the patient seemed quite well. He was sent home to England about a week later and his condition appeared to be normal save for the slight affection of the higher speech centres.

CASE 2.—The patient was admitted to hospital on Oct. 24th, 1915. He had been wounded by a rifle bullet, the entrance wound being 3 inches above the nasion and 1½ inches to the right of the mid-line and the exit wound 2 inches behind the entrance wound and 3 inches to the right of the mid-line. The patient's mental condition was normal, as also were the cranial nerves and the motor system. The left abdominal reflex was greater than the right, and the knee-jerks and ankle-jerks were increased. Double Babinski was present. Temperature 98° F.; pulse-rate 64. An X ray examination showed a defect in the skull situated between the two wounds and several large pieces of bone imbedded in the brain at a depth of from 3 to 4 cm. below the defect in the skull.

Operation.—On the 26th a large scalp flap was turned down, and disintegrated brain matter was seen to be escaping from the defect in the skull. A small trephine opening was made and the bone was removed around the dural defect. A large cavity was found in the brain filled with disintegrated brain matter and containing several large pieces of bone at its bottom. These were gently removed, but cerebro-spinal fluid was seen to be escaping from the bottom of the cavity in the brain. The wound in the scalp did not appear to be grossly infected; it was floored in by a pericranial flap and the scalp was sutured in place. No drain was used. The patient was put on urotropine. On the 27th the temperature was 99·5° F., and the pulse-rate 60. There was some headache. The patient got out of bed, but he seemed rational. 28th: Temperature 100°; pulse-rate 66. More headache. Lumbar puncture showed slightly increased pressure. 29th: Temperature 101·8°; pulse-rate 78. Headache; patient irrational; marked bulging of flap and some œdema. A needle was put in under the flap but nothing was drawn off. 30th: Temperature 100°; pulse-rate 70. Patient quieter; flap bulging less. Nov. 2nd: Temperature 98·9°; pulse 76. Bulging of flap gone; patient usually quiet but at times delusional. He stated that his sister had visited him, but such was not the case. Some headache; passed his urine in bed at times. 3rd: Better; quite bright mentally; no incontinence; wound healed by first intention; no bulging; power normal; knee-jerks normal; no Babinski. Some loss of sensation to pain on left side. On the 16th the patient was transferred to England. Condition the same.

In the first of these cases it is quite likely that the wound was clean, or only very slightly infected, the marked increase in intracranial pressure being due to œdema following the trauma, although the patient appeared to be likely to die from it. This was very markedly relieved after the bullet was withdrawn and the ventricular fluid allowed to escape. The track evidently kept open for some time, as was shown by the accumulation of fluid under the scalp, and it is probable that this kept down the intracranial pressure.

In the second case a certain degree of infection was, I think, present. This is shown by the rise of temperature and the bulging of the flap. Whether this bulging was due to escape of fluid or to bulging of the brain is not certain, but probably to both, as there was some œdema, but nothing like to the same extent as in the former case. Fortunately the patient was able to overcome this infection after the removal of the bone. It is possible that he might have done so if he had been left without operation, but experience has shown this to be more dangerous than operative treatment. In the early stages of the war cases were seen in which patients with indriven fragments of skull were left alone on account of the complete absence of symptoms and rise of temperature, yet almost invariably they developed abscesses around the fragments. Still, it must be admitted that an occasional patient apparently recovers with an inaccessible foreign body in his brain.

THE TREATMENT OF HEPATIC FAILURE IN YELLOW FEVER, MALARIA, AND OTHER CONDITIONS: A SUGGESTION.

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IN THE LANCET of Nov. 21st, 1903, I described a case of multiple liver abscess which terminated fatally. At the time I thought that death was due to shock, but I was puzzled by the symptoms, which were peculiar and suggested some failure of the emunctories. Months afterwards Mr. Harold Stiles, of Edinburgh, informed me that, having read the account of the case, he had no doubt that death was in reality due to delayed chloroform poisoning, a condition which at that time was scarcely recognised. I know now that Mr. Stiles was correct, and I am convinced that symptoms similar to those present in delayed chloroform poisoning may occur in tropical diseases where the liver, so to speak, is thrown out of action, where it fails to perform its functions, and where, as a result, the patient is in imminent peril of his life. A study of tropical pathology has led me to the conclusion that sufficient stress has not been laid on this hepatic failure, at least so far as remedial measures are concerned. Recently, as a member of the Yellow Fever Commission, I have had my attention closely directed to the state of the liver in yellow fever. Recently, also, I have been brought directly or indirectly into contact with cases of so-called "infectious jaundice," and I have been privileged to hear my colleague, Colonel William Hunter, A.M.S., expound his views on the pathology and treatment of this and allied conditions. I have also had opportunities, at Panama and elsewhere, of studying sections of the liver from cases of yellow fever, toxic jaundice, blackwater fever, and malaria associated with icterus, and of noting the marked destruction of liver cells which occurs in those diseases. These studies have brought to my mind a case of malarial infection in the Sudan where, although quinine eventually cleared the blood from a heavy infection of *P. falciparum*, death occurred after a peculiar set of cerebral symptoms. At the time the medical officers in attendance on the case felt themselves between the devil and the deep sea, for they had difficulty in deciding whether these symptoms were due to the action of malarial toxins or were evidence of a tendency to quinine poisoning in a subject very susceptible to the effects of the drug.

In the light of recent work and remembering the condition of the liver as revealed post mortem, I have no hesitation in saying that the symptoms in this case also were an expression of hepatic failure.

Now what are the symptoms associated with the destruction of liver cells? They are chiefly of cerebral origin, pointing to a poisoning of the higher nerve centres. The patient begins to grow restless, watchful, excited, anxious, and light-headed. He complains of severe headache and, it may be, of photophobia. He wanders in his mind and suffers from an incoherency of ideas and from hallucinations. His muscles twitch and tremble and delirium ensues. It may be of a low, muttering type, or may become active, the patient trying to get out of bed, but it is not usually very violent, for there is great weakness. Convulsions may set in, and if cardiac or respiratory failure does not occur coma ends the scene. In addition, we find that if jaundice is already present it deepens, while hiccough, clammy sweats, and anuria are not infrequent.

It will be found that these symptoms are common to delayed chloroform poisoning, yellow fever, severe cases of epidemic jaundice, the so-called Mediterranean yellow fever, Weil's disease, whatever that may be,[1] blackwater fever, certain forms of fatal malaria, acute yellow atrophy, phosphorus poisoning, &c.

All this is well known, but confining ourselves to the tropical diseases, it would seem that these symptoms have

[1] Recent Japanese work goes to show that Weil's disease is due to a spirochætal infection (Journ. Exp. Med., March, 1916).

been vaguely attributed to the action of the toxins of the virus causing the disease and that little or no attempt has been made to treat the serious liver condition which is present. It is true that in yellow fever a lessening of the urea function of the hepatic cells and resulting ammoniæmia with its toxic cerebral effects has been recognised, and we are advised to dilute the toxins in the blood and to stimulate the action of the kidneys by an alkaline treatment such as that of Sternberg. This treatment has the further benefit of counteracting the blood acidosis which is present in these cases, and which may be recognised by the occurrence of acetonuria. It is noteworthy that Burkitt has quite recently treated with success cases of blackwater fever by means of intravenous injections of calcium chloride and either potassium or sodium bicarbonate. By this means he combats the diminished blood alkalinity, for the urine in blackwater cases contains acetone. The acidosis, of which it is the expression, is due to the fatty acids being poured into the blood owing to the disordered hepatic condition, and the above line of treatment is undoubtedly based on sound principles. The object of this note, however, is to suggest that we may go further and, on the lines indicated by Colonel Hunter in cases of toxæmic jaundice, &c., endeavour to prevent or at least cut short the rapid destruction of liver cells which, it seems to me, plays so important a part in bringing about a fatal issue in such diseases as yellow fever and bilious remittent fever.

It is necessary briefly to consider how this destruction is brought about. Colonel Hunter's views are fully set forth in Allbutt's "System of Medicine," Vol. IV., Part 1. He believes that in such diseases the antitoxic functions which the liver cells discharge in relation to the portal blood are first of all depressed and then suppressed by the poisons generated by the disease viruses. Strain is thrown on the liver cell. It endeavours to maintain its energy by taking up carbohydrate material. If sufficient cannot be obtained from sugar it turns to fat, and when this also fails to yield the supply to tissue proteins. There is thus increased fat metabolism with acidosis and acetonuria, and the liver cell, coming under the influence of its own ferments, undergoes autolysis and thus presents the characteristic appearances seen post mortem. Colonel Hunter further thinks that ammonia, as a rule, keeps the ferments in check, and that the practice, common alike before operations and in the early stages of febrile diseases, of purging the patient with calomel and of withholding food, prevents the formation of ammonia and thus the hepatic ferments have full play. As already stated, the liver cells being thus thrown out of action fail to deal with the poisonous portal blood. The latter passes unchanged into the general circulation and the characteristic cerebral symptoms result.

I am aware that Colonel Hunter's views have not met with acceptance in all quarters and that the precise manner in which the disease toxins act on the liver cells has not been ascertained. It may, as has been suggested, be a neutralising action upon anti-ferments which, quite apart from any question of ammonia, normally preserve the hepatic cells from self-digestion. All this question requires further elucidation, but Colonel Hunter's theory and researches have certainly led to one important practical conclusion—i.e., the necessity in cases of delayed chloroform poisoning and toxæmic jaundice of keeping up the supply both of sugar and of protein food, the latter in peptonised form. The former is ensured by the administration of glucose. It can be given by the mouth or as rectal enemata, solutions of 5 or 10 per cent. being used. If pure glucose cannot be obtained, preserved (candied) fruits may be given, or, indeed, sugar in any form. The necessity for protein is met by administering enemata of peptonised beef-tea, eggs, or other protein material.

So far as I know, this line of treatment has not been tried in those tropical diseases in which hæmohepatogenous jaundice is a marked and important feature, and it is with the object of directing attention to the advisability of employing it that I submit these few notes. They make no claim to any originality, but merely voice a suggestion which I trust may prove useful, for the treatment of yellow fever and other tropical diseases in which liver failure occurs is at present far from satisfactory.

Cairo.

HYSTERICAL MUTISM IN A BOY.

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THIS case is recorded for two reasons. In the first place, because of its intrinsic interest as an example of psychical shocks succeeding each other at short intervals and culminating in typical "hysterical mutism" with its sudden and dramatic recovery. Secondly, because it seems a particularly instructive case at the present time. Since the outbreak of war there has been a distinct tendency to suggest that various affections occurring as the result of war conditions are, in their nature, something essentially different from what one has observed previously in times of peace. This tendency shows itself by the giving of qualifying names to such conditions, thus: trench fever, trench feet, trench nephritis, camp jaundice, shell shock, &c. Time will show whether any of these affections are actually something new or whether they are old acquaintances brought into special prominence by war conditions.

History of Case.

A little 'boy, aged 11 years, was sent to my out-patient clinic at the Royal Hospital, Sheffield, on Feb. 4th, 1916, by Dr. Thomas Chetwood, school medical officer for Sheffield, with a history of having been completely dumb for five weeks. His mother dates the beginning of his illness, three years ago, when he was knocked down by a taxicab in Doncaster. After the accident he was unconscious for twelve hours. He sustained a long, deep cut over the right occipitoparietal region, which necessitated several stitches, and suffered from severe concussion. He was kept in a darkened room for five days and was not allowed to go to school for twelve months. Before the accident he was, according to his mother's statement, a bright, intelligent lad, but afterwards he became heavy in appearance, lethargic in his movements, and slow at learning his lessons. His condition remained the same until December, 1914. The family had removed to Hartlepool, and were living there when the bombardment took place on Dec. 16th, 1914. The boy was at breakfast when the shelling began, and immediately became very excited and terrified, much more so than his brothers and sisters. This excitement and nervousness persisted for some time, and was intensified a few days later by a rumour that an air raid was expected. He would not be left alone, and insisted upon sleeping with his parents and keeping his clothes on all night. The excited condition wore off after a while, and he reverted to his previous dull mental state, but his behaviour was still characterised by a certain nervousness. Soon afterwards they removed to another part of the country, where his father was foreman of a gunpowder factory. This factory was blown up by an explosion of great violence on June 7th, 1915. The boy was in the village when the explosion took place. He became very excited, and anxious about his father, who was in the factory at the time of the explosion. The excitement occasioned by this accident wore off after a little time, but the boy's mental apathy seemed more marked. He made no progress with school work, and his schoolmaster pointed out a lack of concentration—"his thoughts were always wandering." This continued until November, 1915, when his mother began to notice symptoms of "queerness" in the boy, and on Nov. 19th, thinking his behaviour somewhat irrational, she asked him, "as a test," to sweep out the cellar, "without providing him with a light." He performed the task properly, but while his mother was upstairs later in the day he raked out the whole of the fire in the kitchen grate. This last incident was typical of his strange behaviour from this time onwards. Occasionally he would whistle or sing loudly, which he had not been accustomed to do previously. From being dull and lethargic in appearance, he became at times wild-looking and developed a vacant stare. He would not sleep alone. They had by then removed to this neighbourhood, and his mother sought advice regarding his condition at a local hospital. His symptoms were attributed to enlarged tonsils and adenoids, and tonsillectomy was advised. The correctness of this diagnosis was disputed by his mother, who remarked without being asked, that "he did not snore, he did not breathe through his mouth, and he did not speak thickly." However, it was decided to operate on him. On being told of this he became very terrified and remained so up to the date of operation on Dec. 29th, 1915, from which time until the date of admission he has been absolutely mute, never uttering a sound.

When I saw him on Feb. 4th, 1916, five weeks after the operation, his condition was as follows. Rather small for

his age, face pale, brows knitted, no appearance of excitement. When spoken to he makes no reply. Asked to say the words "father," "mother," he moves his lips slightly, and it is possible to distinguish a difference in the movements of his lips corresponding to the two words, but there is no sound uttered. He understands everything that is said to him, and responds by suitable actions. Asked to whistle, he puts his lips in position but makes no sound. Various forms of treatment had been tried, including faradism, to the throat, but without effect; it was therefore arranged to take him into hospital, and further general examination was deferred until then.

The patient was admitted into the Arthur Jackson ward during the afternoon of Feb. 9th, and I saw him there shortly afterwards. He was playing at draughts with another boy, and the condition of mutism remained just the same. On the following afternoon, whilst going round the ward, I found him in bed, and being unaware of what had occurred since my visit the day before I asked him to whistle. To my surprise he did so at once, and when I commented on his improvement he replied in normal speech. Inquiry as to when and how recovery took place elicited the following curious story. The ward is an adult male medical ward; at one end there is a small single ward. The occupant of this single ward was an old man, of somewhat wild appearance, with long hair standing straight up from his head. During the early hours of the morning this old man wished to go to the closets, which are at the opposite end of the ward. He therefore put on his dressing-gown and walked down the ward. As he came round the broad pillar of the central fireplace of the ward the little boy happened to wake up, caught sight of this bizarre figure in the semi-darkness, and screamed. The old man, who had heard of the arrival of a dumb boy, and wishing to be friendly, came up to the bed and asked him if he was the "dumb boy." This intended kindness frightened the boy still further. The result was that he shouted for the nurse. The spell was broken!

A considerable number of cases of mutism, attributed to shell explosions, have been recorded, and the question as to whether they are simply "hysterical" or not has been raised. This case seems in some respects to form a link between the hysterical mutism of peace and the mutism occurring under war conditions. The boy, although not in the trenches, was exposed for a short time to terrific shell fire at Hartlepool. Six months later he was in close proximity to an explosion which may fairly be compared in severity to that of a trench mine. Yet neither of these tremendous shocks was sufficient in his case to produce immediate "mutism." It was reserved for an ordinary surgical operation of everyday occurrence in civil life to supply the back-breaking straw, and determine the onset of symptoms. Had the condition arisen as an immediate effect of either the Hartlepool shock or of that at the gunpowder factory, as it might easily have done, it would have gone to swell the total of cases due to the bursting of a high explosive. As it is, it favours the view that the cases of mutism occurring as a result of the war conditions are probably instances of hysterical mutism rather than anything distinct and different in their origin or nature.

In this boy we see the cumulative effect of repeated psychical shocks, at considerable intervals of time. In the soldier of neuropathic tendency the conditions of modern trench warfare must produce psychical shocks quite overwhelming in their cumulative action—a summation of stimuli. As regards the determination as to what form the hysterical manifestation takes, it is interesting to note that in this boy the mutism followed an operation on the throat—the neighbourhood of voice production. So also, ordinary hysterical aphonia is often preceded by laryngeal catarrh.

It does not seem unreasonable to suppose that, in cases of mutism following shell explosion, the particular form which the hysterical manifestation assumes is determined by the powerful effect necessarily produced upon the auditory apparatus, which, as we know, is intimately associated with the spoken word.

I do not propose to discuss at length the relationship between hysterical aphonia and hysterical mutism, or the possible difference in the seat of the lesion. Wyllie[1] divides the speech mechanism into two parts, the oral, comparable to the violinist's left hand stopping the strings and varying the notes, and the laryngeal, corresponding with the violinist's right hand wielding the bow and producing the tone. The simile is an apt one. To produce normal effects both mechanisms must work harmoniously. In hysterical aphonia the laryngeal mechanism alone fails—the patient speaks, often volubly, but it is in a toneless whisper. To elaborate Wyllie's simile, the bow wants "resin" or is not properly applied. In hysterical mutism both mechanisms have failed—there is no sound produced at all. The bow is not pushed across; the fingers are not applied to the strings. In this boy the conditions seem to be intermediate. The fact that he could place his lips into recognisable forms required for various words may be compared to the condition of a violinist who can still use his left hand to "stop" the notes, but produces no sound because he does not apply the bow to the strings at all. The seat of trouble in such cases is somewhere higher up than all these mechanisms. To apply Wyllie's simile, it must be in the player himself, he simply cannot make himself play. That the mechanism in both parts is intact is proved by the completeness of recovery following, as it so often does, immediately upon some sufficient emotional stimulus.

In my experience hysterical manifestations are not very uncommon in boys. In 1900[2] I recorded a series of such cases taking various forms. Until recently, however, I have never seen a case of "dermatitis artefacta" in a boy. A few weeks ago a boy aged 13 was sent to my out-patient clinic with one of the most striking "artefact" eruptions that I have ever seen. In the middle of the right cheek there was an irregular area, about the size of a five-shilling piece, consisting of a group of small excoriations, obviously due to friction. In the centre was a circular black patch about the size of a shilling. The mother informed us that the eruption had first appeared a year before and was then said to be ringworm. It disappeared after a time and had recently appeared again. The black centre had only been noticed for the last few days, and had naturally caused considerable and gratifying alarm. The black pigment was easily removed by the application of wet lint, it appeared to be soot. If "dermatitis artefacta" is a hysterical manifestation, and (at times) it certainly is, this boy was a hysteric.

In conclusion, it is well to bear in mind that the correct diagnosis of these cases, satisfactory as it may be to the medical man, does not always determine their cure. The hysterical mute may continue mute for long enough; the "dermatitis artefacta," though its nature is exposed, will recur again and again. The boy whose case forms the subject of this paper, after recovering his speech completely, has now (April, 1916) relapsed into a curious "mumbling" or "lalling" speech, which is at times almost unintelligible. His mother, who had shown her incapacity to deal with the boy previously by the incident of the "dark cellar," has recently tried to cure him by a good "thrashing"! It has only made him worse. Such cases, as everyone knows, are most difficult to deal with. Sometimes the hysterical child is master of the household, or at any rate of that portion of it which counts; at other times the parent has no idea of how to deal with the nervous child. If these things had not been so, there would possibly have been no hysterical manifestations.

I am indebted to my former clinical clerk, Mr. F. G. E. Hill, for the notes of this case.

Sheffield.

[1] The Disorders of Speech, 1894.

[2] Hysteria in Boys, Quarterly Medical Journal for Yorkshire, vol. viii., p. 393.

A CASE OF PALPEBRAL CHANCRE.

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AND

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CASES of unmistakable palpebral chancre are sufficiently scarce to merit careful description. Moreover, early diagnosis is of considerable moment, alike from the standpoint of cure and prevention of infection. Microscopic examination of scrapings may detect the treponema pallidum, or the Wassermann reaction may be positive; but there can be little certainty in the early weeks, at all events, without such confirmation. In the following case, recently in hospital under our care, several features were not in accord with the usual text-book descriptions, and it illustrates the necessity of using all available diagnostic means.

The patient, a private aged 34, entered hospital on Oct. 28th, 1915. About 14 days previously his right eyelids were stuck fast in the morning; this continued each morning till admission. The lower lid then became swollen close to the nose, but there was little pain at any time. Two days before admission, when trying to open his eye, something "cracked," and he found a break in the swelling near its middle. When first seen the lower lid was œdematous for most of its length. The palpebral and ocular conjunctiva was injected, and a firm oval swelling, about the size of a hazel-nut kernel, extended from beyond the lower punctum to the inner canthus. Its upper surface was slightly ulcerated and covered by a dirty greyish film, leaving on removal a grey mottled surface with a few bleeding points. On palpation a sensation of hardness and induration was imparted by the swelling; indeed, this dense cartilaginous feeling, with the absence of marked pain on pressure, first aroused suspicion of a chancre. Incision through the conjunctival aspect yielded no pus, and on scraping, the tissue was found to be friable and to bleed freely. There was no glandular enlargement, and thorough scrutiny revealed no other signs of syphilis past or present. On the three succeeding days scrapings and serum from the ulcerated surface were examined for treponemata by dark-ground illumination, with negative results. A sample of blood, sent to Rochester Row for investigation, was reported on Nov. 13th as giving a positive Wassermann reaction.

During this interval the condition displayed no rapid tendency to increase. The ulceration spread somewhat in depth and inwards, involving the caruncle and a small portion of the upper lid. The edges of the ulcer were better defined, and the induration had become even more marked. The preauricular gland was now palpable; no definite enlargement of other glands. A first injection of kharsivan and mercury was made on Nov. 13th, when the first photograph was taken. (Fig. 1.) By the 16th the swelling was less than

FIG. 1.

Before kharsivan treatment.

half in size, induration had largely disappeared, and the ulcer showed a clean and rapidly contracting surface. Two more injections of kharsivan and four of mercury were given, forming a complete first course of treatment. By Dec. 2nd the lid was of normal outline, with complete disappearance of the swelling. Only a small fissure remained where ulceration had been deepest, and obstruction of the lower canaliculus followed due to ulceration. The rapid disappearance of ulceration and induration and the final healing of the sore within one week from the first injection of kharsivan formed a remarkable and gratifying spectacle.

The patient denied all knowledge of any possible source of contagion. In such cases the victim would rarely have any suspicion of the character of the infection, and thus its source can seldom be established. As in many instances, the infection here was purely accidental. He shared with 11 other men a common sleeping-room, and it is at least probable that a contaminated towel or finger conveyed the organism. In all likelihood some irritation of the eyelid existed. For instance, watering of the eyes is accompanied by frequent rubbing; this is likely to bring about irritation of the lids with more or less conjunctivitis, and also to introduce the infecting agent. Ramsay[1] describes a case where blepharitis existed before infection, and in our case watering of the right eye for three years followed facial erysipelas.

In the first two weeks the lesion is most apt to be confounded with a stye, and White and Martin[2] state that this mistake is frequent. The picture is of a reddened inflammatory swelling of an eyelid near the inner or outer canthus with some œdema, but no ulceration at first. The stye, however, is acutely painful and quickly shows a spot on the lid margin where pus is about to point; an incision will promptly relieve both pain and swelling, with evacuation of a variable quantity of pus. A chalazion is rarely seen on the lower lid near the inner canthus; it is, moreover, usually small, free from inflammation and pain. In acute dacryocystitis no confusion should arise, although

FIG. 2.

After kharsivan treatment.

this case was sent as such. The main swelling is over the area of the lacrymal sac and is not localised to the lower lid, apart from other distinguishing features.

When ulceration has taken place the floor is covered with a dirty greyish film, leaving on removal a bleeding surface. The margins are firm and fairly well defined and circumscribed, with some slight elevation. The whole swelling is remarkably firm; and this characteristic induration, felt when grasped between finger and thumb, is as in penile chancre the most convincing feature. Secondary ulceration of syphilis, lupus, rodent ulcer, and epithelioma ought rarely to present difficulty in diagnosis. The age of the patient, situation of the sore, previous history, and other indications should differentiate them.

Enlargement of preauricular, submaxillary and other glands is described as an early and constant symptom in chancre of the eyelids. In our case the preauricular gland alone was enlarged by the end of the third week, and swelling of no other glands could at any time be detected, though carefully sought for.

To recapitulate, a palpebral chancre may present the following features: a papular swelling of lower or upper eyelid near either canthus, accompanied by some œdema of the lid and injection of the conjunctiva, closely resembling a stye, but without much pain, and yielding no pus on incision; later forming a circumscribed ulcerating surface covered with greyish membrane, with slightly raised firm margins, and giving a characteristic cartilaginous feeling on palpation; and with or without enlargement of preauricular, submaxillary, and other glands. The presence of the treponema pallidum in surface scrapings or, failing that, a positive Wassermann reaction forms positive proof; while rapid disappearance and healing of the lesion under salvarsan treatment puts the diagnosis beyond a shadow of a doubt.

We have, in conclusion, to express our thanks to Colonel William Turner, R.A.M.C., O.C. Connaught Hospital, for his kindness in permitting the publication of this case.

BY an oversight, no acknowledgment was made in Sir StClair Thomson's article on Malignant Disease of the Nose or Accessory Sinuses, in THE LANCET of May 13th, of the courtesy of the Oxford Press Warehouse in lending the blocks of Figs. 2, 3, and 4, which were taken from Burghard's "System of Operative Surgery." We regret the omission.

[1] Maitland Ramsay: Atlas of External Diseases of the Eye.

[2] White and Martin: Genito-Urinary Surgery.

Medical Societies.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

The Diagnosis of Nerve Injuries in War Time.

A MEETING of this society was held on May 4th, Major A. H. BUCK, R.A.M.C. (T.F.), the President, being in the chair.

Major C. F. BAILEY, R.A.M.C. (T.F.), read a paper on Diagnosis of Nerve Injuries in War Time. He mentioned the importance of not jumping at the conclusion that because it did not appear probable that a nerve injury could have occurred in any particular case, therefore no such injury had taken place. He emphasised the importance of careful search for sensory defects, particularly loss of epicritic sensibility, and mentioned various fallacies which might arise, adverting to the difficulties experienced with foreigners, malingerers, and patients of low degrees of intelligence. In Major Bailey's opinion condenser-testing was of the greatest value, and superseded faradic and galvanic muscle-testing. His method for obtaining extreme accuracy was to test doubtful muscles against normal muscles of the opposite side. He also referred to the difficulty experienced in preventing the powerful currents, which were necessary to cause contraction of damaged muscles, from overflowing and causing contraction of the damaged muscles' opponents, which in electrical treatment would be harmful instead of beneficial. The cases which had been operated on at the 2nd Eastern General Hospital had repeatedly proved the accuracy of the diagnosis as given by the condensers. He gave accounts of various cases of injured nerves—more especially of severed hypoglossal, spinal accessory, third and fourth cervical, posterior thoracic, ulnar, median, musculo-spiral, sciatic, and other nerves.

The PRESIDENT discussed cases of nerve shock. He inquired whether in cases in which the nerve is constricted, but not divided, paralysis of the nerve is shown by complete reaction of degeneration. If the nerve trunk is ruptured in its course does it recover function without operation?

Captain H. GERVIS, R.A.M.C. (T.F.), commented on the extreme accuracy of modern methods of testing, and asked how the difference in the skin resistance is allowed for.

Lieutenant-Colonel R. F. JOWERS, R.A.M.C. (T.F.), inquired as to the condition of nerves supposed to be functionally paralysed.

Dr. E. R. HUNT mentioned a case of local anæsthesia immediately following the extraction of a lower molar tooth, due presumably to injury to the mental branch of the inferior dental nerve.

Major BAILEY, in his reply, said that cicatricial constriction might produce complete reaction of degeneration. Complete or high degrees of reaction of degeneration indicated the advisability of exploration. If the nerve was torn across the ends might be so close that recovery was possible, but for practical purposes this was unlikely. The difference of skin resistance was got over by interposing such a large constant resistance that the variable skin resistance was negligible.

A vote of thanks to Major Bailey was proposed by Lieutenant-Colonel JOWERS and seconded by Captain GERVIS.

The annual meeting of the society was held on May 4th, Major BUCK being in the chair.—The annual report and balance-sheet were passed. Captain Gervis was elected President for the session 1916–17; Dr. Hunt financial secretary; and Major Bailey literary secretary.—Dr. L. A. PARRY proposed, and Dr. R. J. RYLE seconded, a vote of thanks to the retiring President for his services during the past year.

HARVEIAN SOCIETY OF LONDON.—A clinical meeting of this society was held on May 11th at the Stafford Rooms, Dr. Edmund Cautley, the President, being in the chair.—The following cases were shown:—Dr. Graham Little: (1) Case of Septic Papillomatosis of the Lower Extremity which had led to great overgrowth; and (2) a Soft Sore which had lasted 13 years and had led to extraordinarily extensive scarring.—Dr. F. Langmead: Intrathoracic Tumour in a Young Woman. The X rays revealed a shadow behind the upper part of the sternum and the microscopical examination of an excised portion supported the view that the mass was lymphadenomatous.—Dr. A. Stewart: (1) Multiple Osteomata developing in an adult male; and (2) a man on whom he had successfully operated for Temporo-sphenoidal Abscess.—Mr. C. A. Pannett: A patient with Stone in the Ureter. An X ray was shown with an opaque bougie in the ureter alongside the stone.—Dr. C. S. Jaffe: A woman with Enlargement of the Liver accompanied by jaundice.—Mr. Zachary Cope showed a photograph of the patient who survived for three days after an electrical burn caused by a current of 11,000 volts. Three limbs of this patient were destroyed by the current.

Reviews and Notices of Books.

Mosquito Control in Panama.

By JOSEPH A. LE PRINCE, C.E., A.M., and A. J. ORENSTEIN, M.D. With an Introduction by L. O. HOWARD, LL.D. London and New York: G. P. Putnam's Sons. 1916. Pp. 335. Price 10*s.* 6*d.* net.

THIS book describes in detail the eradication of malaria and yellow fever in Panama by Surgeon-General Gorgas, who had previously been responsible for a similar achievement in Havana. It is an absolutely authoritative book, for one of the writers, Mr. Le Prince, was the chief sanitary inspector to the Isthmian Canal Commission for ten years from 1904, the other, Dr. Orenstein, is an assistant chief sanitary inspector to the Commission, while Dr. Howard is the chief of the Bureau of Entomology of the United States Department of Agriculture.

Our knowledge of systematic antimalarial efforts previous to 1904 is largely based on the performances of Surgeon-General Gorgas in Cuba and of Sir Ronald Ross in the British Eastern dependencies, a great deal of which work is well known to all our readers. The situation on the Suez Canal before President Roosevelt appointed Surgeon-General Gorgas as chief officer shows that unless the American administration had acquired a real scientific knowledge of malaria the American engineers and workmen would have incurred the high sick-rate and appalling sacrifice of lives that proved the destruction of the original French plans. The Ancon Hospital, for example, is admirably placed in magnificent grounds, but if these had been maintained in their semi-tropical luxuriance entirely for the encouragement of anopheles, they could not have been more exactly designed. It is no wonder that during the first year of the work all the staff of the hospital were down with malaria. As soon as general sanitary work was fairly under way a preliminary survey was made for antimalarial purposes, when production areas of anopheles were found in every existing settlement and close to all the abandoned French camps.

The authors having set out the meteorological and topographical conditions and their bearing on the Isthmian anopheles, whose different species and areas of propagation are also described, detail under its various headings the campaign against the anopheles whose propagation areas were attacked. The first step in antimalarial work is the filling up of depressions that hold water; this process should be simultaneous with the introduction of effective drainage. With regard to drainage as an antimalarial measure the writers show in an interesting manner that the sanitarian and engineer look at the problems involved from different points of view. The number of factors that enter into good drainage with a view to controlling the propagation of mosquitoes are very considerable, and one thing inevitably suggests itself—namely, that the community which should attempt to get rid of mosquitoes in accordance with the drainage system advocated in this book would require a long purse. Economy, no doubt, in the long run would be served, but in the first instance a good deal of money as well as expert service is required. Attacks on propagation areas are spoken of with but moderate enthusiasm, and the larvicidal action of oil is said to be too slow; much oil also is required to cover the surface of the water, and its presence

is always more or less a source of danger from fire, while damaging the water for domestic purposes. These defects in the use of oil having been recognised in Panama, efforts were made to find a more desirable larvicide. A phenol resin soap devised by the chemist to the Board of Health of Panama is said by the authors to possess many advantages. For instance, it has a high toxicity to mosquitoes and a low one to higher animals; it can be used in a concentrated form without endangering the uniformity of its toxicity; its composition is simple and cheap, and its use is accompanied by no risks of fire. The authors allow that the ideal larvicide has not yet been found, for the phenol resin soap deteriorates upon exposure, does not emulsify readily, and is inert in brackish water.

At the end of the first part of the book, which deals with the whole antimalaria campaign in Panama, the results accomplished are summarised pithily in one small chart. The chart shows the hospital cases of malaria among employees from 1906 to 1913 inclusive, and is compiled by adding the monthly percentages of those sick with malaria. The figures are as follows: In 1906 82 per cent., in 1907 43 per cent., in 1908 28 per cent., in 1909 22 per cent., in 1910 and 1911 19 per cent., in 1912 11 per cent., and in 1913 8 per cent. The book, which is thoroughly readable, shows step by step how this remarkable alteration in figures has been brought about.

The story of yellow fever in Panama is naturally a much shorter one, as little but preliminary observation has been done. But the eradication of yellow fever in the Panama Canal is of equal importance with that of malaria, and we may expect that this disease, which is terribly destructive to the *morale* of the workmen as well as to their lives, will be dealt with systematically by a sanitary corps whose work has so far been brilliantly successful.

CURRENT GERMAN MEDICINE.

Yeast as a food.—Yeast as a source of proteid food material is attracting a good deal of attention. An article by Dr. Wintz, of Erlangen (MmW., No. 13[1]), gives a useful summary of its application. An institute for fermentation products in Berlin placed on the market about a year ago a yeast with the following percentage composition: proteid, 54; ash, 7; fat, 3; extractive, 28; water, 8—giving a calorie value of 4520 per kilogramme. The problem of making the production of yeast independent of that of beer had been successfully solved after five years' experimentation, and the new yeast is grown on a medium containing sugar, ammonia, potash, and magnesia, and produces no alcohol in its growth. The lay press has made much in this connexion of "proteid production from the air," since the ammonia is manufactured direct from the air by Haber's process. The nutritive qualities of the new yeast were first tested on his own family by Professor Schottelius, of Freiburg, and then in a Baden reformatory. In the University Women's Clinic at Erlangen Dr. Wintz introduced twice daily a dish of broth containing 10 grammes of yeast, the taste of which was found to be quite unobjectionable, and which was readily digested. The importance of such an addition to the diet sheet may be gathered from the fact that 20 grammes of this yeast contain 11 grammes of proteid, or about one-sixth of the total amount required in the day. At present the product is still expensive, 1 mark buys only 904 calories, which yet compares favourably with the 537 calories of beef. There is some prospect of reducing the price by the employment in production of the cheaper kinds of sugar, especially if the latter can be produced on a commercial scale from wood. Dr. Wintz concludes with the statement that the medical profession can now with a clear conscience recommend yeast for general use as a valuable foodstuff. Professor Rost, of Berlin, covers much the same ground in a review (DmW., No. 13) of a monograph on the economic significance of yeast as food, fodder, and pharmaceutical product, and calls attention to the use of a particular species—endomyces vernalis (Ludwig)—to produce a yeast rich in fat. He, too, concludes that the medical profession must recognise the value of yeast as a food product.

Employment for the blinded soldier.—Dr. W. Feilchenfeld, of Berlin, estimates (DmW., No. 13) at 800 the present number of soldiers totally blinded in the war for whom employment has to be found. Of the 34,000 blind civilians in the whole country, only 22 per cent. were earning a living, the majority at basket-, mat-, or brush-making and caning chairs. A period of training of two and a half to four years is necessary for work of this kind. Silex, in his monograph on "New Methods for the Care of the Blind" (Berlin, 1916), finds the average weekly earnings in basket-making to be only 8–12 marks. He considers this, therefore, not a suitable occupation for the blinded soldier. A few with the necessary gifts may become tuners or even organists. Typewriting, which Silex considers may occupy a quarter of the whole number, is regarded as less suitable by Dr. Feilchenfeld, as the blind typist can only write from dictation or dictaphone and cannot correct his own work. In peaceable times he can hardly hope to compete successfully with the man who can see. Silex therefore had the idea of himself looking round various large industries to search for any suitable occupation for the blind. In the Spandau munition works he found numerous blinded soldiers occupied with cartridges in various ways, mostly packing, and others back again at their old work as shoemakers, carpenters, and tailors. No long apprenticeship was necessary, and an average daily wage of 3.68 marks was being earned, which he thinks might rise in time to 4.40 marks. Silex proposes a travelling commission consisting of a factory inspector, an intelligent blind man, and perhaps a blind teacher, to seek in any large business some possible post in packing, tying, sorting, or serving of a simple machine suitable for a blind man. If the factory is in the country and the worker can live not too far away, he may be independent of any outside assistance and free, too, from any stigma of charity.

[1] MmW. = Münchener Medizinische Wochenschrift. DmW. = Deutsche Medizinische Wochenschrift.

JOURNALS.

Brain, a Journal of Neurology. Edited by HENRY HEAD, F.R.S. Vol. XXXVIII. Parts 3 and 4.—No. 3 of this journal consists of three papers. The first is on the postural activity of muscles and nerves by C. S. Sherrington, and is really a study of the often discussed subject of muscle tonus. It need scarcely be said that the paper from the pen of such a writer is interesting and suggestive, and it may also be said that it is most convincing. He shows clearly that as regards skeletal muscles the tonus is reflex, and that it is confined to those muscles which maintain the animal in an erect position, in other words, that reflex tonus is postural contraction. The visceral muscles and those of the circulatory system are also studied, and the tonus in them is found to be of the same character.—The next paper is an elaborate study of muscle tonus, by Professor Langelaan.—The third paper is by Professor Walter Ransom, of Chicago, on Nerve Fibres as Conductors of Protopathic Sensation, in which evidence is brought forward to show that protopathic sensation is probably subserved by the unmyelinated fibres in a nerve.

No. 4 also contains three papers. The first is the address delivered by Dr. James Taylor, as President of the Neurological Section of the Royal Society of Medicine, on the Ophthalmological Observations of Hughlings Jackson and their Bearing on Nervous and Other Diseases. An abstract of this address appeared in THE LANCET in November last. It is an appreciative review of the valuable ophthalmological work of an accurate observer, and a great man.—The second paper is by Dr. Ramsay Hunt on the Sensory Field of the Facial Nerve, and he adduces evidence which seems almost conclusive that the facial, like the trigeminal, glosso-pharyngeal, and vagus nerves is to be regarded as a mixed sensory and motor nerve, the sensory part being concerned with the innervation of the internal ear, the middle ear and its prolongation into the Eustachian tube and mastoid cells, and the skin on certain parts of the external ear.—The third paper is by Dr. Byrom Bramwell, Dr. Shaw Bolton, and Dr. William Robinson on Bilateral Lesion of the Occipital Lobe, with Retention of Macular as Distinct from Panoramic Vision. The case is an exceedingly valuable one in that the patient was under periodic observation for no less than 24¼ years, and the post-mortem examination confirmed the diagnosis of "bilateral lesion in the occipital lobes," made 24 years before death occurred. The clinical record, with charts of the fields at different times, is unusually complete, and the very full account of the post-mortem examination, with numerous plates illustrating the condition of the brain, renders the case a very valuable one in reference to the anatomy and physiology of human vision.

The Military Surgeon.—In the April issue Dr. Thomas W. Jackson, who was with the American Red Cross Sanitary Commission in Serbia, describes briefly and classifies the miseries which war brings upon women, children, the aged, and other non-combatants who are within its area. Vivid as are his pictures, none, he says, but eye-witnesses can realise how intense, how widespread, are these miseries and afflictions. The chief, the universal, the inevitable accompaniment of war is food shortage and consequent malnutrition, it may be even starvation. How frequent a form of death this was in the dawn of history is seen by anyone who remembers that the word "starve" originally meant *die* in quite a general sense, and the corresponding German *starb* still means *he died*. In other words, when language was forming starvation was the most ordinary form of death. The food shortage tells first on infants and nursing mothers and the weakly. Both the distribution and the production of food are interrupted. Thus, on the Kossovo Plain in Serbia Dr. Jackson saw great fields of ripe, much-needed wheat, unharvested for want of labour. From his experiences in similar conditions of war and famine in Cuba and the Philippines, our author feels that few nations would have saved so much food as did the frugal and industrious Seroians. The destruction of houses is the next most important disaster, the houses knocked to pieces and their inhabitants crowded into others they are lucky indeed to find, for they may be driven into the open. Overcrowding is bad, but to be defeated, roofless, starving, and frozen, is the culmination of bitterness. With overcrowding there is dirt; where there is little bread there is less soap, and infected lice and bed-bugs have more chance to spread typhus and relapsing fever when a bed is occupied not by one person exclusively but by two or three at a time, and that two or three times over every day. Prostitution, too, becomes rife when women have lost their natural protectors, and Dr. Jackson urges that this fact be considered by those who refuse in peace time to provide armies to prevent war. When all the doctors are required for the army there is no medical treatment for non-combatants, neither are there drugs for them, another cruel affliction that the American Red Cross worked hard to alleviate. In spite of all these horrors under which Serbia has groaned, Dr. Jackson feels her heroic spirit can be counted upon to survive for ever.

A reserve of officers.—The medical corps of the United States Army had set up for itself a reserve of officers for war service long before any other section of that army had so provided itself. The medical staff of the organised militia, which corresponds roughly to our Territorial Army, does not want to fall behind that high standard set, and as rather less than half of its established number of field hospitals and ambulance companies only are constituted, it is casting about to encourage the formation of the others, and in this number of the *Military Surgeon* Major Hess, one of the officers at headquarters, details the assistance the Federal Militia Department will give to a newly-raised unit. As soon as it has passed inspection, and it is thus known that the authorised number of men have joined and are physically and otherwise fit for enrolment, that they have headquarters sufficient for drill and for the care of Government property, and that the State (that is the province) has made arrangements for their maintenance, all uniforms and equipment will be issued to them free of charge, and when required regular officers will be detailed to instruct them, and the units will be sent to camps of instruction for 10 to 15 days each summer. It is noted that they may be mobilised not only for war but in cases of dire industrial or natural disaster, such as mine explosions, floods, and earthquakes, which will make their service more useful and more interesting.

New equipment for the "hospital corps" soldier.—The "hospital corps" soldier of the United States is to have a new equipment we learn from the same number of this journal. It has been evolved by a board of three junior officers, and is based on the new equipment of that army for its cavalry. The special equipment of the "hospital corps" soldier is all carried in his belt on which are ten pockets and a frog for a small hatchet. Eight pockets are large enough to take two first dressing packets each and the five at the back do so, the remaining three and the half-size pocket on each side in front carry other things, iodine, swabs, sal volatile, scissors, diagnosis labels, &c. Wire gauze for making splints is no longer on the establishment, plenty of materials to take its place being available on every battlefield. The new equipment is lighter than the old, there are no straps across the soldier's chest, he can ride with it just as well as march, and it will wear better. Numerous photographs are given of this workmanlike outfit. The weight is not mentioned.

The Indian Journal of Medical Research, Vol. III., No. 3.—In continuation of his previous studies of experimental cholera infection, published in this journal, Major E. D. W. Greig, I.M.S., contributes a further series of observations on the lesions of the biliary passages of rabbits dying after repeated intravenous injections of living cholera vibrios. Cholecystitis, with or without gall-stone formation, is apparently a frequent cause of death of rabbits so treated. With a view to throw more light on such questions as gall-stone formation and the carrier problem in cholera Major Greig has made a number of fresh experiments, full details of which are now given in his paper. He also furnishes a second contribution on the alteration in serological and morphological characters of a strain of cholera vibrio. Both of these papers are illustrated by coloured plates, charts, and tables.—Major S. R. Christophers, I.M.S., supplies two articles, the first dealing with the revision of the nomenclature of Indian anophelini, to which is appended a long list of references; his second paper describes an Indian tree-hole-breeding anopheles, A. Barianensis, James = A. (cœlodiazesis) plumbeus, Haliday.—The male generative organs of some mosquitoes form the subject of a contribution, with illustrative plates, by Mr. Baini Prashad, M.Sc., Alfred Patiala Research Scholar, of the Punjab University, Government College, Lahore, who also furnishes a second paper on the Halteres of the Mosquito and their Function.—Mr. P. R. Awati, medical entomologist of the Central Research Institute, Kasauli, continues his "Studies on Flies," his present paper being entitled "Contributions to the Study of Specific Differences in the Genus Musca." This is illustrated by 19 plates.—Mr. J. L. Mitter, entomological assistant at the Kasauli Central Research Institute, writes on the life-histories of (*a*) Hæmatobia sanguisugens, Austen, an Indian species of blood-sucking muscid; and (*b*) Bdelloralarynx sanguinolentus, Austen, a purely Oriental species.—Major J. W. Cornwall, I.M.S., director of the Pasteur Institute of Southern India, Coonoor, writes on "Some Centipedes and their Venom," with five illustrative plates.—A short description is given by Major A. G. McKendrick, I.M.S., of a method for the rapid demonstration of Negri bodies, illustrated by a coloured plate drawn by Miss Gladys M. Brown.—Lastly, the number closes with a very interesting editorial on malaria and jungle clearing, in which attention is drawn to the recent scientific research on malaria, carried out in the Federated Malay States, and its application to practical measures. Notice is also directed to the fact that India for some time past has been playing a part as a pioneer in this type of investigation. The editorial concludes with a word of caution. To demand, it says, on the strength of results of the clearance of wet low-lying primeval forest in the Malay States, as described by Dr. Malcolm Watson and others, similar operations with similar results in Bengal, is the outcome of a misconception. Jungle-clearing operations do not necessarily work only in the way that has been so successful in the Malay States, and "the influence of jungle of various kinds on the causation of Indian malaria makes the subject of this association one demanding unbiassed and careful consideration and experiment."

The Journal of the Canadian Medical Association.—In the issue for April there appears an account by Sir James Grant of some of his early experiences as physician, and the final paragraph, which is headed "Serum Therapy in 1861," is a distinctly interesting note. It runs as follows:—

In 1861 my general health was on the decline from an unknown cause, which I concluded resulted from some poisonous influence, contracted while on duty, General Protestant Hospital, Ottawa; never contracted syphilis or anything of that character. I made every effort to regain my usual health and strength without evident success. In 1861 was invited by the late Dr. Hamnett Hill to assist in a surgical operation in the General Protestant Hospital, and contracted blood poisoning—the outlook most unpromising. After several weeks' serious illness made an excellent recovery, my system regaining in every particular the normal state of health and vigour. To account for such a marked constitutional change for the better aroused in

my mind the idea, one poison had actually counteracted another. It then struck me to test the effect of serum of ordinary vaccine lymph, in skin disease, particularly psoriasis, and with most practical results. On February 20th, 1863, after three years' careful research, published a record in the *Medical Times and Gazette*, London, England. From that date to the present I have enjoyed perfect health, never absent from duty a single day. At that time, owing to the remarkable results of vaccine serum in disease, I felt we were on the eve of a great change in therapeutic serum power, and placed in my paper of 1863 a paragraph in large type that "man has still much to learn." Since that date Virchow, Pasteur, Koch, Lister, Wright, and Flexner have revolutionised the domain of bacteriology by remarkable scientific achievements. Since 1861 I have frequently used the serum of vaccine, as an alterative in cases of constitutional debility, with excellent results.

The claims of the different pioneers in serum-therapy have never been altogether settled. Richet and Héricourt laid their papers in 1888 before the Academy of Sciences in Paris showing their experiments and conclusions, but the underlying ideas had occurred to other pathologists, as 27 years previously they had occurred to Sir James Grant, and he informs us that last year he received a letter from Dr. Fielding R. Garrison, of the Surgeon-General's Library at Washington, as follows: "So far as I am able to determine from an examination of the literature indexed in this Library, your interesting cases would appear to be the first in which vaccine virus was definitely employed for the treatment of diseases other than small-pox."

Sir James Grant was born at Inverness in 1831 and qualified as M.D. McGill in 1854, and in 1864 became M.R.C.P. Lond., M.R.C.S. Eng., and F.R.C.S. Edin. He was knighted in 1885, and has been President of the College of Physicians and Surgeons, Ontario, and of the Royal Society of Canada. He has written on the knee-joint, on heart disease, on tetanus, on orthopædics, on tuberculosis, and on other medical, surgical, and scientific subjects in the journals of Canada, the United States, and this country, and is, moreover, a geologist of repute. During his political career he introduced the Pacific Railway Bill to construct the present trans-continental railroad, and few medical men can have lived a fuller life.

Reports and Analytical Records
FROM
THE LANCET LABORATORY.

(1) PROTOSIL; (2) PINEAL GLAND TABLETS; (3) ANTI-TYPHOID-PARATYPHOID VACCINE; (4) TYPHOID-PARATYPHOID AGGLUTOMETER; (5) ARGENTIDE VAGINAL SUPPOSITORIES.

(PARKE, DAVIS, AND CO., BEAK-STREET, REGENT-STREET, LONDON, W.)

1. Protosil is a dark brown hygroscopic scaly substance which readily dissolves in water. It is a proteid silver compound, and according to our analysis contains close upon 20 per cent. of silver, as is claimed. It presents the advantages of not being precipitated by alkalies or by reagents which generally decompose the ordinary silver solutions. It does not coagulate albuminous matter nor does it react even with a chloride. It is stated to be non-toxic even in strong solutions and to be free from irritating effects. It is suggested for use as an antiseptic and astringent in inflammatory conditions of the mucous membrane and as particularly serviceable in uro-genital conditions.

2. The pineal gland tablets represent the activity of the fresh pineal glands of young cattle. The action of the pineal body is interesting in its influence upon mental and physical development up to the time of puberty. The substance has thus been given in cases of backward children and also of premature mental failure in later life. It is said to have a definite stimulating effect upon the sluggish brain.

3. The anti-typhoid-paratyphoid vaccine is contained in ampoules and is convenient for administration for immunisation purposes, and the practice now is to immunise against both typhoid and paratyphoid by administering the respective vaccines simultaneously. This combined vaccine is prepared in the inoculation department of St. Mary's Hospital, London, under the supervision of Sir Almroth Wright.

4. The typhoid-paratyphoid agglutometer comprises a small compact set of apparatus to be used in the differential diagnosis of typhoid and paratyphoid fevers. It contains one ounce each of typhoid and paratyphoid suspension and the usual appliances for collecting the blood and for making the test. The case containing the apparatus measures only 4¼ inches long, 2½ inches wide, and 3¼ inches deep. It is designed to obviate the use of the microscope and fresh live cultures of typhoid and paratyphoid bacilli in the agglutination test. It is stated that laboratory and clinical experiments have shown that the use of the apparatus produces results equal in delicacy and efficiency to the microscopic method, while its conveniences are obvious.

5. The argentide vaginal suppositories consist of soft gelatin cones protected by a tin wrapper. The germicide present, as we have found, is a solution of silver iodide. It is claimed that this salt is superior to silver nitrate inasmuch as it is more stable, less irritating, and does not stain.

"SOLOID" NASAL ALKALINE COMPOUND.

(BURROUGHS, WELLCOME, AND CO., SNOW HILL BUILDINGS, LONDON, E.C.)

This well-known and useful formula in the treatment of the nasal passages has recently been modified by the addition of cocaine hydrochloride. This addition renders the application of the spray or douche acceptable in the treatment of acute conditions in which pain is a feature. The soloids, each of which contains 5 grains of borax, 5 grains of sodium chloride, and 1/6th grain of cocaine hydrochloride, dissolve readily when powdered in warm water, and one soloid dissolved in two or three ounces of water gives for general purposes an antiseptic fluid which can be used in the form of a spray or douche in rhinitis, ozæna, and so forth. The original soloid without cocaine hydrochloride is still supplied.

LYSOL (L. BRAND).

(LYSOL, LIMITED, CRAYFORD MILLS, WARTON-ROAD, STRATFORD, LONDON, E.)

The claims made in regard to the advantages of this preparation are confirmed by our examination. One important point is that it is quite without free alkali; so much so, that its solution in water gives no reaction whatever with the delicate phenolphthalein test. Further, it is not made with caustic soda, but with caustic potash. We obtained marked evidence of the presence of potash salt. The preparation is not only miscible with water, but, as we have found, with alcohol, glycerine, and even chloroform. It is evidently, therefore, a very pure combination of potash soap and cresol. Whilst it is an active detergent, preparing, so to speak, the ground for the action of the antiseptic, it is non-caustic. On separating the soap by means of alkaline lime solution we obtained a yield of cresols amounting to just 50 per cent. Amongst preparations of its kind this is evidently a standard product and one over which particular care is exercised to secure an article constant in composition and antiseptic value.

LA GIRALDA: SPANISH WHITE WINE.

(ROBERT JAMES, SON, AND CO., 17, STORE-STREET, BEDFORD-SQUARE, LONDON, W.C.)

As is well known, Spain produces good wines, and they are, generally speaking, fuller in character than the wines of France. The white wine under examination, however, shows a comparatively low alcoholic strength and resembles a light Sauterne. It is pleasing in character, with a delicate flavour of the grape, while coming well within the category of light wines. According to our analysis, the following was its composition: alcohol by volume, 10·73 per cent., equal to proof spirit 18·81 per cent.; extractive matters, 2·25 per cent.; mineral matter, 0·10 per cent.; sugar, 0·50 per cent.; volatile acidity reckoned as acetic acid, 0·08 per cent.; fixed acidity reckoned as tartaric acid, 0·49 per cent. It is a genuine good unfortified wine free from objectionable preservatives, and is quoted at a moderate price (20*s.* per dozen) considering its attractive qualities.

Sir George Hare Philipson, M.D., F.R.C.P., professor of medicine in Durham University since 1876, attained the age of 80 on May 18th.

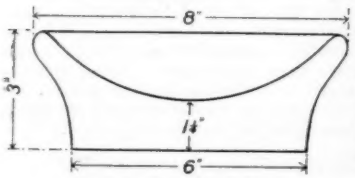
New Inventions.

AN INGENIOUS CRUTCH-HEAD.

WE have received the following letter:—

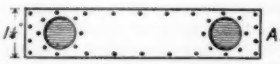
SIR,—I am venturing to ask for your criticism of the crutch-head which I send herewith. It is of a pattern issued in considerable numbers from the Kensington War Hospital Supply Depôt, 13, Kensington-square. In the past year this depôt has turned out many hundred pairs of similar heads stuffed with a mixture of tow and lyxhayr (the well-known fibre substitute for horse-hair); but it seemed to those responsible for the output of the upholstering department that something affording more "resiliency" was desirable, and, thanks to the kindness of Mr. W. L. Bradbury (a most indefatigable and energetic worker at the Depôt), we have been able to make use of some old inking-rollers of the *Punch* Printing Office, with which he supplied us. The head sent is filled with this composition. The substance melts at a comparatively low temperature (it is believed at about 120° F.), and after having been slowly liquefied is poured into a "shell," or half-covered crutch-head, laid on its side. If melted quickly or by too fierce a heat, the composition bubbles and, in cooling, subsides awkwardly. In order to prevent its flowing down the sides of the head when exposed either to a hot sun (or possibly to the heat of an ordinary fireplace), gimp-pins are placed at close intervals round the frame of the head, as shown in the rough drawing sent. But it is hoped that in moderate temperatures and with ordinary care the danger of liquefaction is small. In our conceit we think that there is a pleasing compactness and an elasticity about these heads which is not generally observable in most others of amateur manufacture; but, as I commenced by saying, I beg *your* criticism and advice.

FIG. 1.



Beech head with webbing.

FIG. 2.



Bottom of the head. Distance from edge A to centre of the hole which receives the crutch stick is 1 inch. The nails at the end have ⅜ heads: the others may be ⅜.

FIG. 3

Head and end upholstered, nailed and finished.

I am, Sir, yours faithfully,

ARTHUR DENMAN.

Kensington War Hospitals Supply Depôt,
13, Kensington-square, S.W.

*** The crutch-head seems to us an ingenious and comfortable contrivance. The curves are well designed, and there is sufficient elasticity in the material of which the head is composed to constitute a springy support. We have subjected the head to a temperature of 110° F. and find that it maintains its shape, so that the temperatures of every-day experience would not restrict its use. We have examined a piece of inking-roller used in our printing-room and find that its melting point lies between 119° and 121° F. This confirms Mr. Denman's statement. The material warmed at 120° F. assumes a thin treacly consistence which enables it to be poured into a receptacle in the way described. It therefore seems well adapted for the purpose and is very comfortably resilient, but it may be pointed out that one of the ingredients of the composition is glycerine and this is apt to get moist. The smooth stuff with which the head is covered, pluviusin, is neat to look at, easily upholstered, and readily cleaned. The crutches are not sold; they are made at the Kensington War Hospital Supply Depôt at an extraordinarily small cost, and are distributed to authorised societies and institutions on application.—ED. L.

NATIONAL HEALTH INSURANCE.

Marked Bottles.

THE London Panel Committee has noted that by the Drug Tariff of 1915 druggists were obliged to supply medicine in bottles marked so as to guide the patient in taking the prescribed dose. Marked bottles are, however, not ordered by the 1916 tariff. This is, no doubt, due to the difficulty in obtaining glass bottles of any kind owing to the war, and the same cause prevents druggists from supplying marked bottles even if they should be willing to do so. The result is that medicine is taken in improper quantities and wasted. The most practicable remedy would seem to be the affixing to plain bottles strips of paper marked to indicate the dose prescribed. These could be enforced by regulation and printed to suit bottles of the usual sizes, when it would rest with the druggist to be careful to affix the right strip to the bottle. Graduated medicine glasses have equally been rendered costly and difficult to obtain.

Drugs Supplied in London.

The accounts for the last three years show that the number of prescriptions dispensed to insured patients in London has decreased from year to year; that the average cost per prescription was markedly higher in 1915 than in 1913 or 1914, and that in 1914 it was slightly higher than in 1913. The figures are: 1913, 5,041,555 prescriptions, total cost £155,516, average cost 7·4*d.*; 1914, 4,871,108 prescriptions, total £188,236 0*s.* 6*d.*, average 9·3*d.*; 1915, 4,344,868 prescriptions, total £142,615 5*s.* 2*d.*, average 7·87*d.* Probably several causes have contributed to the falling off in the number of prescriptions made up. There may have been at first a tendency to consult a medical man and to get a bottle of medicine not altogether necessarily, and the attraction of novelty surrounding such a proceeding may have worn off. Beyond question a large number of insured patients are serving in the army or, for reasons connected with war service, absent from home. It is, however, no less important to remember that increased facilities for medical attendance must have a potent effect in preserving the health of the working classes; and also that the high wages which war has produced will have procured better nourishment for many who before were underfed. Some day we shall be able to compare the statistics of peace with those of wartime.

The London Panel Committee and the Question of an Election.

The medical practitioners on the London panel have had their notice called to the new regulations issued by the Commissioners, which enable the period of office of present members of Panel Committees to be extended for a period of not more than 12 months after the end of the war. The members of the panel in any area may press for the holding of the usual annual election, in which circumstances the Commissioners may declare that the regulations above referred to do not apply to that area. In the absence, however, of a collective expression of opinion being received to the effect that an election should be held, the present members of Panel Committees will be deemed to be re-elected.

Bolton Insurance Committee.

At Bolton, in connexion with a decision to surcharge three medical men in respect of alleged extravagance in prescribing, Mr. J. A. Swainson on the consideration of the report pointed out that the Drug Fund had never been sufficient for the purpose for which it was designed. He considered that the Insurance Committee of Bolton should make known its opinion that in town districts there was need for an increase of the sum available for the treatment of insured persons. It had been said at various times that medical men were extravagant in prescribing, but in the case of the three medical men who were being surcharged deductions were being made in consequence of a deficit in the Drug Fund. Medical practitioners could not prescribe as they did before. He knew from his own experience that he could not do so unless he was willing to be fined for so doing, and he had himself only just escaped from being surcharged.

THE LANCET.

LONDON: SATURDAY, MAY 20, 1916.

Infantile Mortality in Scotland, and the Nation's Future.

THE third "Report on Infantile Mortality in Scotland," which includes the proceedings of the National Association for the Prevention of Infant Mortality and the Welfare of Infancy, has been recently laid before the Convention of the Royal Burghs of Scotland by Mr. D. W. KEMP, and it emphasises so many of the lessons inculcated by Dr. S. G. MOORE in his Milroy Lectures[1] that we need no better reason for returning to the whole of this important subject. In particular the report lends force to the important points to which Dr. MOORE called attention, when urging the necessity for measures specifically directed against infant mortality, if the State desires to check disastrous wastage. Sanitary effort, the demolition of slum dwellings, the supervision of food, including the milk-supply, the advancement of medical and obstetrical science, have been no less conspicuous during recent years in Scotland than elsewhere in the United Kingdom, but the yearly loss of infant life remains much as it was 60 years ago. A chart, which is published in this report, shows the rise and fall in the number of deaths of children under one year old per 1000 births in Scotland from 1855 to 1915. It proves that in 1915 these deaths stood at a point or two above what was reached in 1855, when they amounted to 125 per 1000. It also shows that the highest figure was recorded so recently as 1897, when it came near to 140, and that if the lowest (106 per 1000) occurred in 1912 it was only less by three or four than that registered in 1859 and later in 1879. The criticism and comparison of particular figures may be relatively unimportant, but the general deduction which follows from them must command attention. It is that for more than half a century infant mortality in Scotland has exhibited no substantial improvement, and that if its ravages are to be resisted we must initiate and press forward suitable measures. Such measures must combine with, and be supplemented by, improved conditions of life affecting adults as well as infants, and be under the guidance of medical science, as sanitary legislation has been, but they will have to be devised for the special benefit of the mother and the infant, and concentrated upon them through the agency of workers specially trained for the purpose. The report of the National Association, to which we have referred, notes the enrolment of 222 students for the advanced course of lectures on infant welfare, and observes that these "will eventually be scattered over the world." The number, no doubt, is not great when the magnitude of the field thus indicated is taken into account, but allowance must be made for an exceptional period in which an enormous number of women are being absorbed into the profession of nursing. No doubt many of those who never contemplated a nursing career before the war will find themselves after it is over imbued with a new interest in the welfare of their fellows, and from their ranks may be drawn some at least who will work for purposes of infant welfare.

A circular of the Local Government Board for Scotland, dated August 15th, 1915, is referred to in Mr. KEMP'S report, which, in summarizing the general policy indicated, calls attention to a detail which is of interest. In connexion with the earning of Treasury grants, it is noted that contributions made by local authorities to institutions may rank for such grants, but that no grants will be made direct to any institution. Mr. KEMP refers to this as a distinction between the administration of the funds in England and in Scotland, and ascribes the decision to grant only through the local authority to the desire to avoid overlapping, in which he is probably right. A further observation which he makes in this connexion is not without a distinctive national touch. "What, however," he says, "we must jealously guard against is that England does not get more proportionately out of the Treasury than Scotland." He possibly expresses this unexpected anxiety because, as he points out, there have been some few schemes approved by the Local Government Board before the Scottish authorities have been able to propose theirs. England, to quote his expression, has got a little ahead. We are certain that no unfair competition on the part of any section of our common island need be apprehended, and that all medical men and all social workers desire to see Scotland and England working in rivalry indeed for a common end, but combining in honourable conspiracy to secure as much pecuniary aid towards that end as the necessary economy of the Chancellor of the Exchequer will sanction their receiving. The justice of the demand which they will emphasise when appealing for assistance to combat infant mortality will be admitted by all, but for the present at any rate, as Mr. KEMP himself points out, in the national crisis caused by the war a large grant cannot be expected. One of the strongest arguments for a great increase of the grant hereafter will be that by saving infant life from avoidable destruction we shall be lessening the certain results of war upon our population.

In our issue of Jan. 29th we published a communication from a contributor who suggested a scheme for the reduction of infant mortality by what he described as "a system of vicarious adoption." By this a central body, and through its intervention particular subscribers, would take direct personal interest, without legal responsibility, in expectant mothers of the poorer classes and in their babies when born. In a leading article on the Conservation of Infant Life in the same number of THE LANCET we called attention to this proposal, which we described as one for bringing the public into close

[1] THE LANCET, April 22nd (p. 849) and 29th (p. 895), and May 6th (p. 943), 1916.

and sympathetic relation with the whole problem of infant welfare. Mr. KEMP in the report under discussion indicates an approval, which we are gratified at having won, by printing our article and the communication of our correspondent for the information of the Convention of the Royal Burghs of Scotland. We hope, and indeed have no doubt, that full consideration will be given to both by that ancient and honourable body, and we believe that it is by no means impossible that the movement suggested, if once set on foot and efficiently organised, might achieve considerable success. Sympathy with "lonely soldiers" at the front has, as is well known, produced for them "fairy godmothers." These have not only sent them parcels of delicacies to supplement their rations, but have done their best to cheer them with letters in the trenches. It may be that the "fairy godmother" idea will meet with a similar welcome when applied to actual infants, and that "godfathers" who will undertake a certain pecuniary obligation will not find themselves excluded. In Scotland, as in England, there is ample room for voluntary agencies to work side by side and in combination with official bodies, for the war has only emphasised for the whole kingdom the need for vigorous and concerted action.

The Diseases of Active Service.

THE majority of the diseases from which our troops are suffering whilst on active service are the same as those which occur in time of peace. Rheumatism (articular and muscular), bronchitis, pneumonia, disorders of digestion, are met with very frequently; certain infectious diseases, notably dysentery, are inseparable from a campaign, but by no means unknown in times of peace or among civil populations. Fortunately in this war, typhoid fever, which has so often caused the death of vast numbers of soldiers, has been rendered far less virulent owing to preventive inoculation. The tendency to regard certain diseases as peculiar to service in the field has shown itself mainly in the adoption of various terms such as "trench feet," "trench fever," "trench nephritis," "shell shock," and so on, but those who employ these names, mainly for convenience, are aware that further investigation and research are being carried out in regard to the etiology and nature of these conditions, and that it would be imprudent to conclude hastily that they are essentially different from those which occur amongst the civil population at ordinary times. The term "trench feet" has been adopted in place of "frost-bite" because it was found that exposure to cold and wet at a temperature above that of freezing-point would produce the phenomena hitherto associated with extreme cold, although the morbid changes appear identical. The exact nature of "trench fever" has not yet been determined. It is possible that it is a distinct infection, although some physicians are of opinion that it is of an influenzal nature, and certainly further research is necessary before it can be definitely given a place in any official nomenclature. A large number of men have been admitted into the hospitals with albuminuria, and the term "trench nephritis" has been used to designate the condition. Here, again, some observers maintain that a definite infection is responsible for the numerous cases which have presented themselves, and that therefore the etiology is different from nephritis as met with amongst civilians. But some further work on the subject will have to be done before this conclusion can be adopted.

The term "shell shock" has been used to include certain symptoms which are found in men who have been in the actual firing line. Some physicians desire, and very logically, to confine this term to the symptoms appearing after a man has been rendered unconscious by shell explosion, although no actual bodily injury has been sustained, but similar symptoms also occur in soldiers who have been simply exposed to shell fire without becoming unconscious. The question arises whether this condition essentially differs from the conditions produced in ordinary phases of life by shock of various kinds to the nervous system. Traumatic neurasthenia has long been recognised, and shortly after the passing of the Workmen's Compensation Act many men made claims under the Act who were suffering from a variety of symptoms to which the term "traumatic hysteria" was rightly applied. Such cases still figure frequently in many industrial practices. Many of the cases which, because they occurred at the fighting front, have been diagnosed as shell shock might probably be placed in the same category as the industrial cases. The symptoms vary greatly both as regards nature and severity. Some of the patients suffer for months in spite of most skilful treatment, whilst others recover speedily under electrical or other suitable measures. An interesting example of shock producing nervous symptoms is described in our columns this week by Major A. J. HALL—in civil life Professor of Medicine in the University of Sheffield—under the title "Hysterical Mutism in a Boy." Major HALL'S patient had been knocked down by a taxi-cab three years before, and since that time, instead of being a bright, intelligent lad, had become heavy in appearance, lethargic in his movements, and slow at learning lessons. In December, 1914, he was at Hartlepool when the bombardment took place, and for a time he was very excited, but reverted to his previous dull mental state. In June, 1915, he was in a village where a factory was blown up by an explosion of great violence, and again he became temporarily very excited, and subsequently his behaviour grew strange. In December, 1915, he was operated on for removal of adenoids, and from that time he became absolutely mute. He remained thus for between five and six weeks, when early one morning he was much frightened by a man in the ward, and he at once shouted for the nurse. A considerable number of cases of mutism attributed to shell explosions have been recorded, and it is quite possible that they have been instances of hysterical mutism. Major HALL'S patient, in fact, seems to form a link between the hysterical mutism of peace and the mutism occurring under war conditions. The boy had been exposed for a short time to shell fire and had been in close proximity to an explosion, but it was reserved for an ordinary

surgical operation of everyday occurrence in civil life to supply the back-breaking straw and determine the onset of the condition. We agree with Major HALL in his remark that in the soldier of neuropathic tendency the conditions of modern trench warfare must produce psychical shocks quite overwhelming in their cumulative action—a summation of stimuli.

Some of the doubts we have suggested as to the correctness of the nomenclature now being adopted can only be satisfactorily cleared up after the lapse of a considerable period of time, owing to the investigations which will have to be made. In the meantime it is interesting to note that the army medical authorities insist that all disabilities sustained by officers and men should be recorded on board papers and medical history and case sheets in strict accordance with the nomenclature of the Royal College of Physicians. The terms "trench feet" and "shell shock" will not be found therein, and consequently "frost-bite" and "neurasthenia" or similar terms must be substituted. The exact nature of the symptoms and signs should, of course, be mentioned in the notes, so that when the records are required for the purposes of investigation they may indicate the phenomena which existed and the circumstances under which they arose.

Annotations.

"Ne quid nimis."

CEREBRO-SPINAL FEVER: REPORTS TO THE LOCAL GOVERNMENT BOARD.

A RECENT volume[1] (New Series, No. 110) of reports to the Local Government Board on public health and medical subjects contains reports by five different contributors upon the important work on cerebro-spinal fever which has been done during the last 18 months. A preliminary memorandum by Dr. A. Newsholme, medical officer of the Board, summarises the information contained in the other reports. He states that while it was recognised in last year's outbreak that great diagnostic value attached to the discovery of meningococci in the cerebro-spinal fluid of patients suffering from meningitis, it was then doubtful what measure of importance should attach to the finding of meningococcus-like organisms in the naso-pharynx of contacts with cases of cerebro-spinal fever. This point was therefore made the subject of special inquiry, and is dealt with at length in the reports of Dr. A. Eastwood, Dr. F. Griffith, and Dr. W. M. Scott on the prevalence of meningococcus-like organisms in the naso-pharynx of persons attending certain metropolitan out-patient departments during part of 1915. The patients in question had not, so far as could be ascertained, been in actual contact with cases of cerebro-spinal fever, but as there was a considerable number of cases of this disease occurring in London and elsewhere at or about this time, the probability of such absence of actual contact is relative rather than absolute. Dr. Scott also reports on a similar examination, including one made at a rural school in Kent. The result of these investigations was the discovery in more than 10 per cent. of non-contacts in London of organisms indistinguishable from meningococci by microscopic, cultural, and fermentation tests. Among the 56 Kentish school children, however, only one gave a positive result. In commenting on the largeness of the London figure, Dr. Eastwood emphasises four special circumstances: (1) that the cases examined were hospital out-patients; (2) that the swabs were taken by an expert and thus the overgrowing by mouth organisms reduced to a minimum; (3) that a special culture medium (Kutscher's) was employed; (4) that much time was given to searching the plates. He holds that, until the serological relationships have provided definite evidence to the contrary, each of this large percentage of organisms must be regarded as possibly capable of producing cerebro-spinal fever. It is on this point that differences of opinion exist. Dr. Eastwood's attitude is a scientific one, but from the point of view of the practical administrator it may be more convenient to refuse to promote the meningococcus-like organisms found in the throats of these non-contacts to the rank of meningococcus merely because they resemble that organism in cultural and fermentative characters. If we read the report correctly, out of 49 meningococcus-like organisms collected from 480 non-contacts only 28 were submitted to serological examination, and of these only five qualified as that micro-organism by absorption tests. The naso-pharynx is the habitat of Gram-negative cocci of many different kinds. The more common of these cocci are easily distinguished from the meningococcus by their fermentative and cultural characters. When these have been excluded, however, there remain a number of "pseudo-meningococci," possibly responsible for various catarrhs and colds, which can only be distinguished from the meningococcus by serological means. Under these circumstances the surest method we have at present of identifying the virulent meningococcus in the naso-pharynx of carriers—that is to say, the organism of immediate epidemiological importance—appears to be to prepare a series of specific agglutinating sera covering the various types of meningococcus isolated from the cerebro-spinal fluid of the cases in a local outbreak, and to refuse to identify any suspect coccus as the meningococcus until its serological behaviour corresponds with one or other of the types found in the cerebro-spinal fluid. This is the procedure indicated by a Special Advisory Committee to the Medical Research Committee, appointed to consider the problems of cerebro-spinal fever,[2] and it has been attended with conspicuous success. Of the two remaining reports, Dr. Bruce Low's deals with the prevalence of cerebro-spinal fever in the world, and is replete with lucid information supplying the epidemiological data that were needed for the correct appreciation of the recent outbreak. Dr. R. J. Reece's report on the outbreak itself must be regarded as preliminary in nature, as it deals chiefly with the civilian population, and does not include a full account of the incidence among troops. It includes the outbreak at Salisbury, which is of special interest because of the practical trial there by Dr. W. J. Penfold of a prophylactic vaccine prepared from the local strain of meningococcus. Some 3500 persons were vaccinated and the results were distinctly encouraging. The volume should be widely read and studied, along with the Medical Research Committee's report, by all interested in the new and fascinating public health problems presented by cerebro-spinal fever.

[1] Wyman and Sons, Limited, 29, Breams-buildings, E.C. Price 2s.

[2] THE LANCET, Feb. 26th, p. 471.

GUIDO BACCELLI: THE TRIBUTE OF ITALIAN MEDICINE TO HIS LIFE AND WORK.

LAST week, writes our Rome correspondent under date May 10th, the Capitol drew together in the Hall of the Curiatii and Horatii the most representative muster of Italian medicine ever witnessed since the country's unity and independence were proclaimed more than half a century ago—the occasion being that of commemorating the lately deceased Guido Baccelli, whose services to the national cause were only less than his contributions to the science and art of medicine as research worker, clinical teacher, and consultant. Her Majesty the Queen-Mother Margherita had already considered and approved the programme of the Commemoration, which included, as a gift to the Capitoline Museum, all the decorations, Italian and foreign, conferred on the illustrious physician, teacher, and statesman during his long career. The Syndic (Lord Mayor) of Rome, Don Prospero Colonna, supported by the Cabinet Ministers, the Senatus, and the medical consultants who formed the "commission" of the celebration, opened the proceedings with a recapitulation of the chief *momenta* in Baccelli's life and work, dwelling on his devotion to the rehabilitation of the Eternal City as culminating in the famous "Archæological Promenade," which enables the pilgrim to recall in a forenoon the historical crises of which the Palatine, the Caelian, and the Aventine were respectively the scene. Then followed His Excellency Signor Grippo, the Minister of Public Instruction, in an eloquent survey of Baccelli's salutary reforms when holding that portfolio, after which came the tribute of Italy's French sister, conveyed by Professor Joseph Teissier, who fills the chair of Clinical Medicine in the University of Lyons, and who spoke in the name of the French Education Minister and of the collective clinical schools of France. Professor Teissier's discourse was the oratorical feature of the occasion, illustrating the apophthegm of the French critic that "the judgment of foreigners is that of a contemporaneous posterity," and summing up the "title-deeds to fame" by which Baccelli will be remembered far beyond his native Italy, not only in the domain of medicine in theory and in practice, but in that of public instruction and of social rehabilitation, culminating in that "sense of citizenship" which is already the most reassuring coefficient of the "Italy that is to be." Before resuming his seat, which he did amid salvoes of applause, Professor Teissier laid on the bust of the hero of the day a crown of laurel and oak-leaves, interwoven with a ribbon displaying the French tricolour, on which was written: "To Guido Baccelli, the French Minister of Public Instruction." The Rector Magnificus of the University, Professor Tonelli, came next with an estimate of Baccelli's achievement in academic reform; and then followed the tribute of Professor Maragliano, of the Genoese School, succeeded (after a loudly applauded interlude of His Excellency Signor Barzilai on Baccelli in his political capacity as "first citizen of Rome") by a series of "reminiscences" from former students of the Roman clinique, of the more memorable among Baccelli's contributions to scientific and therapeutic medicine. These "old pupils," nearly all of them professors or *docenti* of the medical schools "from the Alps to Etna," contributed to the celebration what was perhaps its most striking feature—a succession of tableaux of the great clinician in his daily walk, from bedside to bedside, in the wards of the Santo Spirito, verifying or modifying the methods of cure announced from the professorial chair. The methods in question, many of them as original as they were effective, will form a volume to be distributed among practitioners in town and country. And with this impressive "march-past" of original work in diagnosis and therapeutics the assembly broke up, not the least edified being the lay auditors, among whom were the heads of the *corps diplomatique*, the British Ambassador, Sir Rennel Rodd, his French, Russian, North American, Spanish, Portuguese, Belgian, Scandinavian, Japanese, and South American colleagues—all except those from the courts of Berlin and Vienna.

DISCHARGE FROM THE ARMY OWING TO TUBERCULOSIS.

A MEDICAL correspondent has called our attention to the hardship involved in the discharging of soldiers from the army who have developed tuberculosis or heart trouble as a result of the hardships of trench warfare, but with regard to whom it cannot be said positively that the disease was the result of their military service, although it may have been aggravated by it. As a consequence, he points out, a man who might have lived to old age in comfortable and safe employment, but who gave it up in order to fight for his country, may be, and frequently is, discharged from the army as unfit for further service to seek employment, with or without success, as an invalid, his incapacity not being regarded as so directly due to his service as to entitle him to a pension. Our correspondent is not alone in his interest in this matter. If a man has a leg or an arm blown off in battle it is clear that no doubt or question can arise as to the fact that military service alone is the cause of his injury, but if a man contracts a particular disease in circumstances in which the majority of his comrades escape it, it is not an unfair inference that some predisposing and undiscovered weakness existed before he enlisted. Nevertheless, the hardship is obvious when we reflect that but for his having served in the field the man might have continued to enjoy his accustomed health, and that this was good enough to enable him to earn his living without consciousness of any physical inferiority as compared with his fellows. It is to be hoped that when the pressure and stress of the present war are over cases of this kind may be reconsidered and injustice redressed, if any be found. It must not be forgotten that these men were allowed to serve as being fit to do so after undergoing medical examination, and that we are on the eve of compulsory service for a large class of those who have not volunteered, while considerable pressure has been put upon many who have enlisted recently. To compel a man to serve in the army as being one physically qualified to do so, and then to discharge him from it with broken health and without compensation would not be fair treatment; and the disabled soldier has the best possible claim to be treated not merely with fairness, but with generosity.

NITROGEN RETENTION IN THE BLOOD.

WHILE the value of estimations of the urea content of the urine as a test of renal efficiency, especially when carried out by the hypobromite method, is now regarded as relatively small, there can be no doubt that a knowledge of the quantity of nitrogenous waste bodies present in the blood is capable of affording valuable indications as to prognosis and treatment. Some interesting observations on

this subject are contained in a recent paper contributed to the *Edinburgh Medical Journal* for April by Dr. Francis D. Boyd, who used the methods of Folin and Dennis for estimating the non-proteid nitrogen of the blood. From these it appears that the percentage of such materials may rise as high in other diseases as in ordinary cases of Bright's disease, and also that the blood pressure in cases of renal disease is not directly proportional to the amount of nitrogenous waste products present in the circulation. Nevertheless, large percentages are of bad import, anything over 50 mg. of non-proteid nitrogen in 100 gm. of blood indicating that the patient is in a dangerous condition. If as much as 100 mg. per cent. are discovered there is immediate danger of fatal uræmia. Treatment in such cases of nitrogenous retention must be directed to diminishing the protein intake and eliminating the waste materials by other routes besides the kidneys. For the latter purpose purgation is most useful. For the former the old-fashioned milk diet is not really suitable, as it actually contains a larger amount of protein in relation to its nutritive value than many other forms of food. If possible, it is advisable in cases of nitrogenous retention to withhold all food for 24 hours, giving only water to relieve thirst. Afterwards such things as water-arrowroot, cream, sugar, and stewed fruits (apples, prunes, figs) may be allowed, such diet being sufficient to supply energy for a patient at rest in bed. In cases of chronic nephritis examinations of the blood-nitrogen must be made from time to time as a means of regulating the diet permitted, since it is harmful to restrict nitrogenous food unnecessarily, the general nutrition then tending to suffer and the kidneys being in turn injuriously affected. The largest quantity of protein along with other foods that can be assimilated without giving rise to undue nitrogen retention is desirable.

THE DEBT OF MEDICAL SCIENCE TO THE BREWING INDUSTRY.

THE interesting address delivered by Mr. Horace Brown, F.R.S., LL.D., at a meeting of the Institute of Brewing last week, on "Reminiscences of Fifty Years' Experience of the Application of Scientific Method to Brewing Practice," reminds us again of the debt which modern surgery, like preventive medicine, owes to the fermentation industries. It is common knowledge, of course, though it may not always be kept in mind, that the study of the diseases of beer led Pasteur to opine that there was more than a mere analogy between the phenomena of fermentation and those of the contagious and infectious diseases of men and animals. The germ theory of disease was, in fact, the outcome of these researches, and to a great extent we owe modern bacteriological developments to the study of a great industrial process, the production of healthy beer. It was found, as chemical knowledge grew more thorough, that there was something beyond mere chemical changes which shaped the healthy progress of beer in the making, and it was eventually disclosed that adventitious micro-organisms were a source of mischief. Out of this discovery arose the beginning of bio-chemistry. As everyone remembers, it was the study of alcoholic fermentation, so closely and fruitfully worked at by Pasteur, which led Lister to associate the inflammation of open wounds with the action of micro-organisms introduced from without, and Mr. Brown pointed out fairly that Lister achieved the ultimate triumphs of his surgical revolution upon inspiration which came from the scientific work carried on in a distillery. The existence of micro-organisms was established and the discovery of specific pathogenic bacteria soon followed. We have often emphasised the importance of the study of enzymes in physiology and pathology. The subject has made rapid developments, and here again the researches carried out in the brewery have led the way, and further work on the fermentation processes is calculated to conduct us still nearer to insight into the nature of the metabolic life-processes.

THE DIAGNOSTIC IMPORTANCE OF THE ANKLE-JERK.

IN the *Journal of the Royal Naval Medical Service* for April is a paper by Temporary Surgeon Hildred Carlill, neurologist to the Royal Naval Hospital, Haslar, on the diagnostic importance of the ankle-jerk. While it does not contain any new facts, it serves a useful purpose in directing attention to a reflex the significance of which is perhaps not so widely recognised as it ought to be. No examination of a nervous case is complete unless the routine includes testing of the Achilles jerks. They may be regarded as normally present, and their diminution or absence is always of pathological import. The localisation of the Achilles jerk is the arc from the fifth lumbar and first sacral dorsal roots, through the corresponding cord segments, and so by the ventral roots to the muscles concerned. Lesions on either the motor or the sensory side may interfere with the integrity of the arc, and hence reduce or abolish the ankle-jerk. Surgeon Carlill has examined some 1052 sailors, who considered themselves in every way healthy; in 15 cases one or other, or both, Achilles jerks were absent. There is apparently in seven of these cases sufficient evidence to justify a provisional diagnosis of early tabes dorsalis. Among the diseases producing disturbance of the reflex may be mentioned injuries and primary affections of the calf muscles, the sciatic nerve or its branches to the gastrocnemius and soleus, the dorsal roots mentioned above, the cells of the ventral cornua of the epiconus (fifth lumbar and first sacral segments). In both systematised and diffuse lesions of the cord, provided the epiconus is in part involved, the reflexes may be in abeyance. Surgeon Carlill quotes a number of illustrative cases. In two of these he notes that with deep reflexes otherwise exaggerated on one side, from hemiplegia, the ipsilateral ankle-jerk was absent, but he does not offer any explanation of this interesting observation.

PYELOCYSTITIS AND METASTATIC ABSCESSES FOLLOWING TONSILLITIS.

IN an annotation on Appendicitis as a Sequel of Tonsillitis in THE LANCET of March 11th (p. 579), we referred to the importance of the tonsil as a portal of entry of many infections and a source of disease in distant organs. In the *New York Medical Journal* of April 15th Dr. H. B. Mills and Dr. G. A. Sowell have reported a case of tonsillitis followed by pyelocystitis, a sequel which does not appear to have been previously recorded. A boy aged 2 years was taken ill on Dec. 9th with tonsillitis. On the 12th the tonsillitis was practically cured, but the bowels were loose. On the 16th the temperature suddenly rose from normal to 103°, at which it remained for

several days, then fell to normal for a similar period, and again suddenly rose as high as before. After several periods of high temperature, with intervals of normal temperature, the child was admitted into the Samaritan Hospital, New York, on the 27th. Careful examination was negative except for swelling of the left instep, metatarsophalangeal joint of the right big toe, and back of the left hand. All these swellings developed into abscesses which were opened and drained. The urine contained many pus cells and a few red corpuscles. The pus from the abscesses yielded the staphylococcus albus in pure culture. With the opening of the abscesses the temperature dropped from 101·8° to 99·4° for two days and then suddenly rose to 104·4°, at which it remained for three days and then dropped to 99·5°. Repeated examinations of the urine always showed large amounts of pus and the staphylococcus albus in pure culture. Blood cultures were made on two occasions and also showed the staphylococcus albus. Under 15 grains of hexamine daily the urine became almost free from pus. On account of the diseased condition of the tonsils they were removed, and from the caseous material which they contained an almost pure culture of the staphylococcus albus was obtained, there being but slight streptococcic contamination. Thus the bacteriological confirmed the clinical evidence that the tonsils were the source of the infections in other parts. Dr. Mills and Dr. Sowell have not been able to find any record of tonsillitis leading to pyelocystitis, but their attention has been called to another case in which this sequence seemed to have taken place.

THE Ingleby Lecture at the University of Birmingham will be delivered on Wednesday next, May 24th, at 4.30 P.M., in the lecture theatre of the Medical School by Dr. T. Sydney Short, physician to the Birmingham General Hospital, who has taken as his subject, Gastric Ulcer and its Complications.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

SUBSCRIPTIONS.

THE subscriptions to the Belgian Doctors' and Pharmacists' Relief Fund received since the last list was published are as follows:—

	£	s.	d.
Dr. E. D. H. Carpenter (twelfth donation, total £12)	1	0	0
Royal College of Physicians of Ireland—			
Mr. R. B. Balfour, D.L.	2	2	0
Interest granted by Ulster Bank	0	14	1
Mr. J. H. Toplis	5	5	0
Messrs. J. Hayllar and Son	1	13	1
Mr. A. Chapman	0	6	2
Brighton and Hove Association of Pharmacy—			
Mr. F. J. Flatman ...	0	10	6
Mr. Edgar Jones... ...	0	10	6
Mr. J. K. Padwick ...	0	10	6
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Mr. J. W. Chaplin ...	0	2	6
Mr. F. W. Fowles ...	0	2	6
Mr. C. Blamey	0	2	6
Mr. J. W. Bygott	0	5	0
Mr. M. E. Morris	0	5	0

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham-gate, London, S.W., and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

The stock of clothes for the Belgian Doctors' and Pharmacists' Relief Fund has nearly been exhausted, and the Directress of the Committee of Clothing earnestly begs for further parcels of garments of all kinds. More especially the following articles are desired: Ladies' and children's summer dresses, stockings, and socks; suits for men; vests; sports coats for boys and girls; thin overcoats or raincoats. Parcels should be addressed Mrs. de Bless, St. Andrew's Parish Room, Palace-street, Westminster.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THE Annual Congress of this Society was held on May 4th, 5th, and 6th at the headquarters of the Royal Society of Medicine, under the presidency of Mr. WALTER H. JESSOP, who in his opening address dealt with

Some Ophthalmic Lessons of the War.

The PRESIDENT said: First I would refer to the magnificent work done at the Front and in the hospitals here by the members of our society. To Colonel W. T. Lister and other ophthalmic surgeons at the Front has been primarily due one of the greatest surgical achievements of the war—namely, the prevention of sympathetic ophthalmitis. I have corresponded with nearly all our colleagues at the military hospitals and as yet have not heard of a single case of sympathetic ophthalmitis. This result must be due to careful treatment of all cases of injured eyeballs and early and complete removal. Looking at the history of the war and at the enormous number of wounds involving the eye by shell one would have expected the results quite otherwise. In the American Civil War 41 cases of sympathetic ophthalmitis occurred in 254 cases of destruction of the eyeball—that is, 16·14 per cent. The German official returns for the Franco-German War gave the very high percentage 55·6 in all cases of injury to the eyeball. The number of sympathetic ophthalmitis cases were 97, and 52 of these occurred within one year of the injury; the seriously damaged eyeballs gave the highest percentage of sympathetic trouble.

Papillœdema.—A subject this war has helped to clear up is papillœdema. In fracture of the vault a large percentage of cases showed signs of papillœdema, and the opportunities given of following the course of the papillœdema strengthen the view that the old chapters on optic neuritis, choked disc, neuro-retinitis will have to be quite rewritten.

The ophthalmoscopic changes were usually slight swelling of the papilla, sometimes amounting to 1 or 2 D.; the edges of the discs were blurred and indistinct, often there was a narrow yellowish white ring round the optic disc, and the changes were, as a rule, within the equator and near the papilla—in fact, the changes were an œdema of the retina. In some cases there were soft woolly-looking plaques, and in a few cases there was extreme swelling of the optic discs with hæmorrhages, plaques, &c. These conditions were associated with increased intracranial pressure, and on relief of the intracranial pressure the œdema disappeared in a short time, and in ordinary cases no after-changes are to be seen by the ophthalmoscope. This coincides with the findings of Paton and Holmes, who in cases of cerebral tumours have demonstrated that the swelling of the papillæ is an œdema and not an inflammation primarily, and that such cases usually called optic neuritis ought to be named papillœdema.

Trench nephritis.—I have had the opportunity of examining the eyes of about 150 cases of trench nephritis. Many of the first of the cases have been mentioned in the very interesting paper by Mr. R. Foster Moore.[1] These cases of trench nephritis, according to Captain W. Langdon Brown,[2] are examples of acute nephritis, and are epidemic, infective, and due to some specific infection resembling, but not actually, the organism of scarlet fever.

Since the middle of January of this year I have examined carefully, and as a rule several times, the eyes of 45 consecutive cases in the 1st London General Hospital of trench nephritis. On these I wish first to speak, as they have been specially examined by the ophthalmoscope for slight changes. In 21 of the cases (46·6 per cent.) there were signs of œdema of the retina; in many these signs in a few days cleared up, so that the percentage of cases of œdema is probably much higher. In three cases with œdema of the retina there were other changes—one had a single, superficial, flame-shaped hæmorrhage, one commencing retinitis with plaques, and one the signs ordinarily described as albuminuric retinitis. Of this last case, a man 27 years old, the great interest is that all the ordinary changes up to resolution took place in 12 weeks from the onset of general symptoms. The œdema of the retina commencing three weeks after the symptoms of dyspnœa, œdema of legs, &c., was succeeded by white,

[1] THE LANCET, Dec. 18th, 1915, p. 1348.
[2] THE LANCET, Feb. 19th, 1916, p. 391.

soft-looking plaques, hæmorrhages, macular stars. In eight weeks the only changes to be seen were small, hard-looking, white spots at the maculæ, and in 12 weeks the left-eye changes had quite disappeared, and there were in the right eye six small, very bright white spots near the macula. This case was undoubtedly one of acute nephritis, and all the signs of soft, woolly-looking, white plaques, hard-looking spots were present. One was able, as Charcot said, to use the ophthalmoscope to investigate living pathological anatomy, practically as a microscope on the living tissues. In none of these 45 cases were there any signs of pathological changes in the retinal vessels; this fact is true in nearly every other case I have observed. Curiously, in only 3 cases was there a previous history of scarlet fever, and in these 3 cases the ophthalmoscopic appearances were normal. The constant signs in every case were albumin in the urine and œdema in the extremities or face. The blood pressure varied very greatly in different cases. The detachments of the retina mentioned by Mr. Foster Moore due to œdema and sometimes a solid or nearly solid œdema all cleared up. During the clearing-up stage there were white plaques, hard white spots, hæmorrhages, &c. All these symptoms help to confirm the diagnosis of trench nephritis being toxæmic.

Starting, therefore, with trench nephritis being a toxæmia I notice that Mr. Fisher lately has read an excellent paper on gravidic retinitis being a toxæmia. Some years ago I had written a paper for our society on tuberculous retinitis which I never published and here are the drawings illustrating it. The main points are effusions limited or diffuse in and beneath the retina followed during the process of resolution by a retinitis with white plaques which cleared up completely. This clearing up, according to Rochon-Duvigneaud and Mawas, is due to the action of phagocytes, and one can almost by the ophthalmoscope see the process—the periphery of the plaques becoming ragged-looking. Since then I have had other cases where no signs of tubercle could be found and which must have been due to a septic infection. In our Transactions, vol. xxv., p. 102, is the drawing of an analogous case recorded by Mr. R. E. Bickerton; I am showing another case at this present meeting. These cases of toxæmic retinitis in trench nephritis, gravidic retinitis, and tubercle, are characterised by an œdema, sometimes amounting to a definite detachment, diffuse or limited, of the retina, the presence of white, soft, woolly plaques, hard white spots or dots, hæmorrhages, but not primary affection of the blood-vessels. We find the same conditions in the so-called diabetic and albuminuric retinitis. Are not all these generic terms misleading, or rather unscientific? It has long been known that exactly the same signs as, some writers say, are pathognomonic of albuminuric retinitis are found without any signs of kidney mischief and without any albumin in the urine. Is there, therefore, a typical albuminuric retinitis? Are there any definite ophthalmoscopic signs which would make an absolute definite diagnosis by themselves alone? This can be answered much easier in the negative, and I would suggest that there is an œdema of the retina in all these cases, and this œdema may be rendered toxic and thus produce a toxæmic retinitis or toxæmic retinœdema. As to the definite toxin, this may vary in different diseases, but the effect is practically the same. The pathological state of the arteries is not a primary condition in these cases. In toxæmic retinitis or retinœdema the initial signs of the œdema are often missed and only the later gross changes seen, as happens also in papillœdema.

One last word. I would counsel the younger oculists to work at the living pathological anatomical changes by the ophthalmoscope with different methods of illumination and not only by the electric light. Ophthalmoscopy by the ordinary daylight will reveal sometimes much more delicate pathological changes, especially as to the transparency of the retina, than can ever be accomplished by artificial light.

Papers Read.

Mr. J. HERBERT FISHER read a paper on Leber's Disease (hereditary optic atrophy). He suggested that the causal agent might be a disturbance of the pituitary body, of temporary duration and moderate in degree, implicating the visual pathway. If this view proved correct, organotherapy might do good. He exhibited a skiagram showing a honeycomb-like shadow in the situation of the pituitary.—The paper was discussed by Sir GEORGE BERRY, Mr. G. MACKAY, Dr. S. A. KINNIER WILSON, Mr. E. H. E. STACK, Mr. STEPHEN MAYOU, and Dr. C. O. HAWTHORNE.

Mr. FOSTER MOORE contributed a paper on the Retinal Circulation in Arterio-sclerosis. He agreed with Priestley Smith that a high pressure in accessible arteries in elderly men did not necessarily mean high pressure in the ciliary capillaries. A sudden obstruction of circulation due to thrombosis in an artery might lead to relative starvation of tissues, and the patient might awake to find himself blind. Sometimes there was an equally rapid recovery of vision. It was not necessary to invoke spasm of the retinal artery as a cause.—In the ensuing discussion the PRESIDENT, Mr. T. H. BICKERTON (Liverpool), Mr. C. S. BLAIR, Lieutenant-Colonel R. H. ELLIOT, Dr. HAWTHORNE, and Mr. ELMORE BREWERTON took part, and Mr. FOSTER MOORE replied.

Dr. KINNIER WILSON read a paper on Dysmetropsia, meaning thereby a defect in the capacity to appreciate the size and distance of objects. The cases of this peculiar condition he divided into (*a*) those in which the lesion was presumably peripheral, (*b*) those in which it was probably central, (*c*) psychical cases. In a case of the latter a young woman, the subject of hysteria, always saw the right half of objects much larger than the left, and of two shillings side by side she considered that on the right side to be a half-crown. In a case of occipito-parietal tumour objects looked at seemed to be practically touching the observer's face. Dr. Wilson considered that in judging of distances and sizes of objects we learn more from the retina than from so-called kinæsthetic impressions.—The paper was spoken to by Sir GEORGE BERRY, Dr. J. CRAIG, Mr. CYRIL H. WALKER, Mr. MACKAY, and Mr. J. GRAY CLEGG; and Dr. WILSON replied.

Mr. M. L. HINE recorded some observations with the Schiötz tonometer, as a result of which he was of opinion that eserine produced no injury, although many of the cases observed were in children, and that it definitely reduced intraocular tension, a view shared by a number of workers.

Mr. E. TREACHER COLLINS read a paper on Contusion Hypotony. He pointed out that diminution of tension after contusion of the eye, apart from any perforation of the globe, was not infrequent. In most cases normal tension was restored in a few days, in others not for several weeks, and in some it remained so long as to be likely to be permanent. The causes he discussed under the following heads: 1. Diminished secretion; divisible into (*a*) from nerve inhibition, (*b*) from vascular disturbance, (*c*) from epithelial damage. 2. Increased excretion: (*a*) through normal channels, (*b*) through newly-formed channels. After quoting several illustrative cases he submitted his conclusions.—Lieutenant-Colonel R. H. ELLIOT and Mr. A. B. CRIDLAND discussed this and the foregoing paper, and the authors replied.

Foreign Bodies in the Eye and Orbit.

A discussion on this subject was introduced by Mr. A. L. Whitehead (Leeds) and Mr. J. Herbert Parsons (London).

Mr. WHITEHEAD enumerated the various forms of eye injury, and said that the prognosis and treatment of an eye containing a foreign body depended upon a variety of factors. He discussed X ray localisation and the extraction of steel and iron by the electromagnet. If steel were in the vitreous he made a conjunctival flap, punctured the sclerotic behind the ciliary region, and inserted the point of the giant magnet, keeping the current on during withdrawal. In his hospital the onset of sympathetic iridocyclitis secondary to retention of a foreign body in the exciting eye was not common. An injured eye without useful vision should be enucleated if there was even a suspicion of the presence in it of a foreign body. If a foreign substance were not giving pain or discomfort it should be left alone.

Mr. PARSONS discussed the anatomical relations of the eyeball to the orbit, and urged a more accurate study of the relations of the living eye to the bones, which could be done by the insertion of slips of lead-foil in the cocainised conjunctival sac. The eye was least protected against missiles coming from a direction downwards and outwards. Despite the heat generated in a high velocity missile, the particles entering the eye were not always sterile. The diagnosis, pathological condition, treatment and prognosis all depended profoundly on the nature of the foreign body. When the body could not be seen in the eye, skiagraphy must be employed, but this had its severe limitations. He regarded accurate localisation as most important. If this were not within 1 mm. it might mean the needless sacrifice of an eye. Only rarely did a copper particle become encapsulated with restoration of useful vision. He discussed at some length

the production of siderosis bulbi. Glass and porcelain might cause remarkably little reaction in the eye, but eventually the eye usually became disorganised following iridocyclitis. The lens substance and the vitreous formed excellent culture media. The ultimate results of extraction of intraocular foreign bodies by the electromagnet were of profound importance, and had not yet received their due attention. He concluded by alluding to the different operative measures, according to the class of case, and the prognosis in them.

The debate was carried on by the PRESIDENT, Mr. A. HILL GRIFFITH, Dr. J. CRAIG, Mr. TREACHER COLLINS, Mr. GRAY CLEGG, Dr. N. S. FINZI, Captain A. W. ORMOND, R.A.M.C.(T.), Mr. ARNOLD LAWSON, Mr. S. MAYOU, Mr. R. J. HAMILTON, Mr. CRIDLAND, Mr. J. HERN, Mr. J. ROWAN, and Mr. G. MACKAY. Mr. WHITEHEAD and Mr. PARSONS replied.

Treatment of the Syphilitic Eye Affections by the Newer Methods.

A debate on the above was introduced by Mr. J. B. Lawford and Captain S. H. Browning.

Mr. LAWFORD assumed that the "newer methods" dated from the introduction of organic arsenic compounds in the treatment of syphilis. He referred to the abandonment of atoxyl and kindred preparations of arsenic owing to the frequency of optic nerve atrophy. Since the introduction of salvarsan in 1910 this and neosalvarsan had been employed very extensively in ocular syphilis. There was general agreement as to the value of salvarsan therapy in ocular lesions in the early periods of syphilis, primary, secondary, and early tertiary stages (i.e., chancre of eyelids, iritis, cyclitis, &c.), but as to the results in some of the later ocular manifestations much difference of opinion existed. He drew attention to the use of salvarsan in oculo-motor paralysis, ophthalmoplegia interna, and optic nerve atrophy of late syphilis, and in keratitis of the congenital form, and quoted cases. In reference to the reputed noxious effects of salvarsan and neosalvarsan upon the optic and other ocular nerves, he pointed out that, in the opinion of most observers, these complications were in reality fresh manifestations of the syphilitic virus. He submitted that prolonged medication by the classical antisyphilitic remedies was essential, even when the results of salvarsan treatment had been most brilliant.

Captain BROWNING said that in syphilis all aids to diagnosis should be employed. It was not true that all cases of choroiditis were syphilitic in origin. In every case of suspected eye syphilis a systematic examination of the whole body should be carried out, and repeated examination of the lesions made with the dark-ground condenser. Properly carried out, the Wassermann was one of the most reliable serological tests, the original method being the most reliable for general use. But a negative Wassermann did not mean that the patient had not got syphilis. Laboratory tests should be considered in conjunction with all other known facts. Repeated doses of arsenical preparations, combined with mercurial treatment, were needed. He spoke of the appropriate doses of various drugs and methods of administration. Kharsivan he found more toxic than salvarsan, and neokharsivan even more so. Every case must be treated on its own merits. His trials of intramine and ferrivine did not encourage him to continue their use.

The ensuing debate became general, Mr. ERNEST LANE expressing agreement with all Captain Browning's opinions.

Committee on Detachment of Retina.—Clinical Meeting.

The committee appointed to investigate cases of detachment of the retina presented their report, through Mr. Leslie Paton. It detailed the findings in 85 cases, half of which were British. Much satisfaction was expressed with the labours of the committee, who were, on the proposition of Sir George Berry, cordially thanked.

Friday afternoon was devoted to the examination and discussion of an extensive series of cases of peculiar interest at the Central London Ophthalmic Hospital, Judd-street.

On Saturday the society resumed the hearing and discussing of short papers. Major J. F. CUNNINGHAM, R.A.M.C. (T.), and Professor DE LAPERSONNE contributed papers on War Injuries of the Eye; details of many cases were given, and treatment discussed. Colonel W. T. LISTER, R.A.M.C. (T.), suggested a new operation for cases of prolapse of uvea. If an eye with a foreign body in it did not quiet down in the hospital at the Front the practice was to remove the eye. If it did quiet down the eye was left to be watched and treated as required in England.—The following papers were read: Dr. HAWTHORNE: Retinal Changes in Glycosuria. Captain A. W. ORMOND: Treatment of Large Traumatic Hæmorrhage in the Vitreous. Mr. GRAY CLEGG: Spontaneous Intraocular Hæmorrhages. Captain R. BEATSON HIRD, R.A.M.C. (T.): Notes on a Case of Tumour of the Retina. (This was referred to a Pathological Committee.)

CANADA.

(FROM OUR OWN CORRESPONDENT.)

Dearth of Medical Men in Canada.

CANADA is beginning to feel the depletion of the ranks of the medical profession. In certain sparsely settled districts of the Middle West, in the province of Saskatchewan, for example, it has been found necessary by the Provincial Government to introduce into the legislature an amendment to the Rural Municipalities Act empowering municipalities to vote a sum not exceeding $1500 towards the maintenance of a medical man in the municipality. It is proposed under the same Act to authorise municipalities to make grants towards the provision of nurses and the erection and maintenance of hospitals, one hospital serving several municipalities. The urgent need is in maternity cases.

Summer Courses for Early Graduation.

All the medical departments of the Canadian universities this year are conducting summer courses to enable their senior students to graduate some months in advance of the regular time and be released for medical service abroad. The matter was brought to the attention of the universities by the military authorities at Ottawa, who urged the necessity for such action on the part of the universities. The innovation is specially hard on the teachers, but it was felt that the necessity of the times demanded it. The University of Toronto and McGill University, Montreal, promptly complied with the request of the authorities, and it is understood that practically all the universities of the Dominion will follow suit.

Canadian Military Hospitals Commission.

The Military Hospitals Commission have issued their first bulletin, and others will follow from time to time. The objects of this Commission are the provision of convalescent homes and medical treatment for returned invalided soldiers, and for men who have enlisted; the education of disabled men for some vocation; and the arrangement of employment for the able and disabled men at the close of the war. Convalescent homes have already been opened in practically all the leading cities of Canada, and additional homes will be provided as occasion demands.

Treatment of Alcoholic Victims and Drug Addicts in Ontario.

Bringing into force in September, 1916, a prohibition law for the province of Ontario, the Ontario Government has exercised wise forethought in providing for the treatment of alcoholics and drug addicts in that province. By the new measure it will be possible for physicians and guardians to secure confinement of patients and wards in the hospitals for the insane in the province for the treatment of either condition. The alcoholic or drug victim may also enter these institutions voluntarily for one year if required, but before doing so he must be in a condition to understand the bargain he is making and the undertaking of the obligations required of him.

Free Vaccines in Ontario.

A short time ago the province of Ontario began the manufacture and free distribution of vaccines and sera. It has been ascertained that there were some persons in the province who were ready to make profit out of the arrangement, and the fact necessitated on the part of the legislature an amendment to the Public Health Act by which a fine of $100, or three months' imprisonment, will be inflicted upon anyone selling publicly or privately any of the free products manufactured by the Government. It is sad that the warning should have been needed by certain medical men. Under the free distribution 300,000 soldiers have been inoculated against typhoid free of charge by the province of Ontario, the Canadian Government being thereby saved some $225,000. In addition to typhoid vaccine, vaccines to the value of $7000 were supplied free of charge in the month of February, including antitoxin for diphtheria.

Toronto, May 6th.

Public Health.

REPORTS OF SCHOOL MEDICAL OFFICERS.

THE *City of Birmingham* has always taken a leading part in matters of public health administration. During the year 1915 every effort was made to improve and extend the arrangements for promoting the health and well-being of the children attending elementary schools, in spite of the abnormal conditions due to the war. School medical inspections were held at intervals of about a month, but only during the morning sessions; the clinics were open every afternoon, an extra clinic being established (making eight in all), and the city was divided into eight (instead of seven) districts. The report by Dr. S. Lewis Graham does not specify whether the results tabulated are those found on "routine inspection" of all children of certain ages, or on the examination of children specially brought forward as apparently in need of treatment; probably the figures refer to "special" inspections, as the number of defects found amounted to 31,262, and the total number of children examined was 42,757—that is, approximately 73 per cent. of the children had some ailment, though no doubt there were many instances of multiple defect. Next to carious teeth, the most frequently occurring condition that required treatment was the presence of enlarged tonsils or adenoids, of which there were 5049 cases, or 16 per cent.; after this comes defective vision (V. = 6/12 or less) 4055 cases (13 per cent.). The condition of the teeth is not stated, as regards frequency of defect, but it is mentioned that 14,542 children were treated at the dental clinics (in another column of the report the total is given as 17,301), so that at least 34 per cent. of the children examined suffered from defective teeth. Of the 1201 fresh cases of defective vision examined 82 per cent. were hypermetropic astigmatism (61 per cent.) or simple hypermetropia; of the remaining 17 per cent. there were 9 per cent. with myopic astigmatism, 4·4 per cent. with mixed astigmatism, and only 3·6 per cent. with simple myopia. If the parent is not present at the medical examination, and some defect is found that requires treatment, the Birmingham practice is to give a printed note, in a sealed envelope marked "private," to the child for transmission to the parent. It seems doubtful if this would always reach the parent, and in the case of very young children it can hardly be practicable. A better way would be for the nurse to visit the parent, with a note, and explain, by word of mouth if possible, the need for action.

Sheffield ranks as the fourth provincial city in regard to population in England and Wales. It is not yet provided with a school clinic owing to war conditions. "The rooms that were considered inadequate in 1912 have still to be used in spite of the fact that the number of attendances had risen from 31,200 in that year to 79,030 in 1915." Dr. T. Chetwood, however, considers that decentralisation, by the establishment of one or more branch clinics, would not be desirable, as it would lead to much extra clerical work and increased difficulties of administration and supervision; he believes that, with the existing facilities for travelling to the centre of the city from all parts, these disadvantages seem to outweigh the advantages of branch clinics. Possibly there might be some difference of opinion on this point; it would seem to be reasonable to bring the treatment centre as near as practicable to the children needing treatment. The easier it is for the child to get treatment, the more likely the child will get treated. The total number of children inspected in the entrant, leaver, and intermediate groups was 17,807. 80·76 per cent. had no defect of nose and throat; 65 per cent. had either perfect teeth or less than four decayed; and 68·3 per cent. of the intermediate and leaver children had perfect vision. In regard to teeth, an interesting comparative table is given of the findings of the school doctor as compared with those of the dentist. At the ages of 6 to 8 the school doctor generally finds from 39 to 42 per cent. of the children to have four or more decayed teeth and from 11 to 16 per cent. to have perfect teeth. The dentist with mirror and probe finds four or more decayed teeth in 79 to 81 per cent. and perfect teeth in only 3·4 to 4·6 per cent. at these ages. Ringworm of the head was satisfactorily treated by the X rays, the average number of exposures being 4·5 and the average duration of treatment 26 days.[1] There were also 631 cases treated by ointment or lotion, of which only 353 are noted as cured. Spectacles were provided, either free or at a reduced rate, in 1104 cases; and these children are examined at regular intervals afterwards by the surgeon (6 to 12 months). This is an important point not always sufficiently attended to. The glasses very often get broken or damaged, and then do more harm than good. Dr. P. J. Hay makes some criticisms on test-types, stating that "those which can be purchased for sight-testing are all of them unsuitable for children. In addition many, if not all, of them are inaccurate and badly constructed." He proposes new and simpler shapes, which appear to be very well suited to the purpose; he omits B and R, and X and Z, which he says "are anathema to most children (and to not a few adults)." There were 585 "contacts" of notified cases of tuberculosis examined during the year; 72 per cent. were found to be normal, 28 per cent. had suspicious signs, and were kept under observation. There is an open-air recovery school, but the accommodation is inadequate. Dr. Chetwood's report is very interesting and complete.

In the county borough of *Bootle* the number of entrants and leavers inspected was 2955. Of these children 65·3 per cent. had no defect of the nose or throat; 62·6 had either perfect teeth or less than four decayed; 54·3 had perfect vision and 27·7 not less than 6/9 with each eye; 9 per cent. had symptoms of adenoids; and 23·7 had enlarged tonsils.

In the report for the *County of Stafford* the Education Committee thought that school medical inspection would suffer less from a temporary interruption (owing to war conditions) than the recently established tuberculosis organisation, which is largely engaged in treatment; the routine work, therefore, was limited to the inspection of leavers and of cases presented by the teachers as in need of treatment: 7922 leavers were inspected (aged 12–13). Of these children 61 per cent. had normal vision, 77 per cent. had either perfect teeth or less than four decayed, and 63·3 per cent. normal throat and nose conditions.

The average heights and weights are given in the report on Sheffield schools. For boys 12 years of age the average height was 142·6 centimetres (56·1 inches), and the average weight 34·9 kilos. (76·9 lb.); for girls these figures were 145·9 cm. (57·5 inches) and 36·4 kilos. (80·2 lb.). These are considerably in excess of the London average, also of the averages of a group of town schools recently noticed in our columns.[2]

[1] The report, however (p. 27), is not clear on this point.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN the 96 large English and Welsh towns 8780 births and 5040 deaths were registered during the week ended Saturday, May 6th. The annual rate of mortality in these towns, which had been 17·4, 16·4, and 17·0 per 1000 in the three preceding weeks, declined to 15·2 per 1000 in the week under notice. During the first five weeks of the current quarter the mean annual death-rate in these towns averaged 16·7, against a corresponding rate of 16·8 per 1000 in London. Among the several towns the death-rate during the week ranged from 5·4 in Gloucester, 6·0 in Reading, 6·6 in Eastbourne, 6·7 in Walthamstow, and 7·8 in Dewsbury, to 21·5 in Walsall, 21·7 in Burnley, 21·8 in Sunderland, 24·1 in Middlesbrough, and 25·6 in South Shields.

The 5040 deaths from all causes were 617 fewer than in the previous week, and included 383 which were referred to the principal epidemic diseases, against 416 and 431 in the two preceding weeks. Of these 383 deaths, 139 resulted from whooping-cough, 120 from measles, 59 from infantile diarrhœal diseases, 43 from diphtheria, 17 from scarlet fever, and 5 from enteric fever, but not one from small-pox. The annual death-rate from these diseases was equal to 1·1, or 0·2 per 1000 less than that recorded in the previous week. The deaths attributed to whooping-cough, which had been 182, 146, and 175 in the three preceding weeks, fell to 139, and caused the highest annual death-rates of 1·4 in Sunderland, 1·6 in Manchester, and 2·0 in Burnley. The deaths referred to measles, which had been 120, 121, and 119 in the three preceding weeks, numbered 120; the highest death-rates from this cause were 1·2 in Salford and in Hull, 1·4 in Swansea, and 2·5 in Stoke-on-Trent. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 57, 66, and 60 in the three preceding weeks, were 59 in the week under notice, and included 14 in London, 5 in Manchester, and 3 each in Birmingham and Leeds. The deaths attributed to diphtheria, which had been 65, 57, and 46 in the three preceding weeks, further fell to 43, of which

[2] THE LANCET, Sept. 4th, 1915, p. 549.

6 were registered in London and 3 in Liverpool. The deaths referred to scarlet fever, which had been 16, 22, and 24 in the three preceding weeks, fell to 17, and included 6 in London, 3 each in Liverpool and St. Helens, and 2 in Salford. The 5 fatal cases of enteric fever, of which 3 were recorded in London, were 3 below the average in the earlier weeks of the quarter.

The number of scarlet fever patients under treatment in the Metropolitan Asylum Hospitals and the London Fever Hospital, which had declined from 1778 to 1643 at the end of the four preceding weeks, further fell to 1594 on May 6th; 153 new cases were admitted during the week, against 163, 191, and 179 in the three preceding weeks. These hospitals also contained on May 6th 1291 cases of diphtheria, 237 of whooping-cough, 231 of measles, 38 of enteric fever, and 1 of small-pox. The 1243 deaths from all causes in London were 209 fewer than in the previous week, and corresponded to an annual death-rate of 15·0 per 1000. The deaths referred to diseases of the respiratory system, which had steadily declined from 405 to 295 in the seven preceding weeks, further fell to 247 in the week under notice.

Of the 5040 deaths from all causes in the 96 towns, 180 resulted from violence and 390 were the subject of coroners' inquests, and 1549 occurred in public institutions. The causes of 43, or 0·9 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Leeds, Bristol, West Ham, Bradford, Newcastle-on-Tyne, Hull, and in 73 other smaller towns. Of the 43 uncertified causes, 14 were registered in Birmingham, 6 in Manchester, 4 in London, 3 in Liverpool, and 2 each in St. Helens, Warrington, and South Shields.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,372,000 persons at the middle of this year, 1236 births and 700 deaths were registered during the week ended Saturday, May 6th. The annual rate of mortality in these towns, which had been 17·4 per 1000 in each of the two preceding weeks, fell to 15·4 per 1000 in the week under notice. During the first five weeks of the current quarter the mean annual death-rate in these towns averaged 17·7, against 16·7 per 1000 in the large English towns. During the week the death-rate ranged from 9·2 in Falkirk, 9·3 in Hamilton, and 10·3 in Clydebank, to 19·5 in Coatbridge, 20·4 in Kirkcaldy, and 24·9 in Ayr.

The 700 deaths from all causes were 91 fewer than the number in the previous week, and included 57 which were referred to the principal epidemic diseases, against numbers steadily declining from 96 to 65 in the five preceding weeks. Of these 57 deaths, 27 resulted from measles, 12 from infantile diarrhœal diseases, 11 from whooping-cough, 5 from scarlet fever, and 2 from diphtheria, but not one from enteric fever or from small-pox. The annual death-rate from these diseases was equal to 1·3, against 1·1 per 1000 in the large English towns. The deaths attributed to measles, which had been 42, 31, and 28 in the three preceding weeks, numbered 27, and included 17 in Glasgow, 3 in Paisley, and 2 each in Edinburgh and Dundee. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 13, 9, and 11 in the three preceding weeks, were 12 in the week under notice; 5 deaths were registered in Glasgow, 3 in Dundee, and 2 in Aberdeen. The fatal cases of whooping-cough, which had been 4, 14, and 11 in the three preceding weeks, again numbered 11, of which 7 were recorded in Glasgow and 2 in Coatbridge. The deaths attributed to scarlet fever, which had been 8, 5, and 10 in the three preceding weeks, fell to 5, and included 2 in Glasgow. The fatal cases of diphtheria occurred in Glasgow and Edinburgh.

The deaths referred to diseases of the respiratory system, which had been 167, 168, and 159 in the three preceding weeks, fell to 103 in the week under notice, and were 15 below the number registered in the corresponding week of last year. The deaths from violence numbered 29, against 24 and 26 in the two preceding weeks.

In the 16 largest Scotch towns 1171 births and 673 deaths were registered during the week ended Saturday, May 13th. The annual rate of mortality in these towns, which had declined from 20·5 to 15·4 per 1000 in the five preceding weeks, further fell to 14·8 per 1000 in the week under notice. During the first six weeks of the current quarter the mean annual death-rate in these towns averaged 17·2, against 16·4 per 1000 in the large English towns. During the week the death-rate ranged from 5·3 in Clydebank, 9·2 in Falkirk, and 10·2 in Leith, to 19·6 in Kilmarnock, 21·8 in Ayr, and 24·2 in Kirkcaldy.

The 673 deaths from all causes were 27 fewer than the number in the previous week, and included 61 which were referred to the principal epidemic diseases, against numbers declining from 96 to 57 in the six preceding weeks. Of these 61 deaths, 32 resulted from measles, 11 from whooping-cough, 9 from scarlet fever, 5 from diphtheria, and 4 from infantile diarrhœal diseases, but not one from enteric fever or from small-pox. The annual death-rate from these diseases was equal to 1·3, against 1·1 per 1000 in the large English towns. The deaths attributed to measles, which had declined from 42 to 27 in the four preceding weeks, rose to 32, and included 28 in Glasgow and 2 in Dundee. The deaths referred to whooping-cough, which had been 14, 11, and 11 in the three preceding weeks, were again 11 last week, of which 5 occurred in Coatbridge and 4 in Glasgow. The fatal cases of scarlet fever, which had been 5, 10, and 5 in the three preceding weeks, rose to 9, and included 5 in Glasgow and 2 in Edinburgh. The 5 deaths from diphtheria were slightly below the average in the earlier weeks of the quarter, and comprised 4 in Glasgow and 1 in Perth. The deaths of infants (under 2 years), from diarrhœa and enteritis, which had been 9, 11, and 12 in the three preceding weeks, declined to 4, but showed no excess in any town.

The deaths referred to diseases of the respiratory system, which had been 168, 159, and 103 in the three preceding weeks, were again 103 in the week under notice, and were 18 below the number registered in the corresponding week of last year. The deaths from violence numbered 31, against 26 and 29 in the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the registration area of Dublin 286 births and 351 deaths were registered during the week ended Saturday, May 13th. The deaths were equal to an annual rate of 44·7 per 1000 or excluding the 148 deaths resulting from the recent disturbances to 25·1, against 13·5 in London and 15·0 per 1000 in Glasgow.

Of the 351 deaths of all ages, 39 related to infants under 1 year and 73 to persons aged 65 years and upwards. The deaths from the principal epidemic diseases numbered 14, of which 6 were referred to infantile diarrhœal diseases, 3 to enteric fever, 2 each to measles and whooping-cough, and 1 to diphtheria.

No fewer than 80 causes of death were uncertified, while 2 were the subject of coroners' inquest; 132 deaths occurred in public institutions.

In the City of Belfast 211 births and 133 deaths were registered during the same week. The deaths were equal to an annual rate of 17·2 per 1000, and included 24 of infants under 1 year and 22 of persons aged 65 years and upwards.

The deaths from the principal epidemic diseases numbered 16, of which 7 were referred to measles, 4 to whooping-cough, 2 each to scarlet fever and infantile diarrhœal diseases, and 1 to enteric fever.

The causes of 3 deaths were uncertified and 3 others were the subject of coroner's inquests, while 37 occurred in public institutions.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

Surgeons to be Staff-Surgeons: A. T. Rivers, C. J. Aveling, J. M. Hayes, P. B. Egan, F. H. Stephens, and S. Bradbury. K. H. Hole and G. F. Syms have been specially promoted for meritorious examination.

The following appointments have been notified:—L. S. Whitwam to *Fox*. Staff-Surgeon: A. D. C. Cummins to *Victory*, additional, for disposal. Surgeon: P. L. Gibson to *Hearty*. Temporary Surgeons: A. C. Ballance to *Orion*; W. MacMurray and A. G. Evans, both to Mount Stuart Hospital; P. C. Woollatt to Pembroke Dock Hospital; R. W. Brander and W. E. Boyd to *Pembroke*, additional, for disposal.

ARMY MEDICAL SERVICE.

Surgeon-General T. M. Corker, C.B., is retained on the Active List. Temporary Colonel R. R. Sleman, M.D. (Lieutenant-Colonel, R.A.M.C. (T.F.)), relinquishes his temporary commission on vacating his appointment as Assistant Director of Medical Services.

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel H. A. Haines is retained on Active List.

Major J. Lynn Thomas, C.B., late R.A.M.C. (T.F.), to be temporary Honorary Lieutenant-Colonel.

Majors to be temporary Lieutenant-Colonels whilst commanding R.A.M.C. Training Centres: A. H. Safford, B. A. Craig, C. R. Sylvester-Bradley, and T. H. Gibbon.

The undermentioned are granted temporary and honorary rank whilst serving with the British Red Cross Hospital, Netley:—As Major: Temporary Honorary Captain H. L. Tidy. As Lieutenants: H. J. Wallace, R. S. Topham, and L. W. Sharp.

Temporary Major F. H. Humphris (Captain, R.A.M.C. (T.F.)) relinquishes his temporary commission.

Temporary Captain R. R. Wettenhall relinquishes his commission.

Captain D. J. McLaren, from Somerset Light Infantry (T.F.), to be temporary Captain.

To be temporary Captains: R. G. Murray, E. F. Ackery, and A. N. Bruce.

To be temporary Lieutenants: H. Collier, F. A. O'Donnell, J. L. Whatley, C. G. Kemp, C. D. Hatrick, C. W. Dixon, F. H.

Simpson, A. H. Smith, F. C. Jobson, C. Cameron, E. Hudson, C. C. Austen, A. A. Hill, J. Monroe, A. D. Millington, J. V. Watson, W. L. O'Neill, A. C. Price, D. A. Chalmers, J. Gray, R. J. Scarr, R. L. Ferguson, O. R. Allison, T. M. Bride, A. E. Finney, A. E. Rayner, E. E. Hughes, J. L. Falconer, P. S. Green, R. H. Titcombe, F. F. Carr-Harris, E. A. T. Green, H. M. Jackson, T. F. Collins, L. L. McKeever, Temporary Honorary Lieutenant H. W. Bennett, J. D. Wright, H. C. Davies, J. P. Crawford, A. Ball, G. J. McGorty, E. H. Shaw, L. Walton, T. D. Miller, and K. M. Walker.

The undermentioned temporary Lieutenants relinquish their commissions:—P. W. L. Camps, J. A. R. Glennie, F. W. Woods, J. M. Logie, E. R. D. Maconochie, A. F. Horn, C. E. Dashwood, A. H. MacKenzie, G. B. Bartlett, D. Fisher, J. B. H. Davson, E. J. G. Jones, C. H. Martin, M. Remers, W. D. Knocker, C. F. Pridham, R. M. Chance, W. S. Hawthorne, R. A. G. Whiting, F. Slater, R. M. McKay, T. A. Fuller, A. J. Campbell, J. S. H. Lewis, P. E. Middleton, W. E. Burrows, F. Brickwell, A. E. Campbell, E. G. Kaye, C. H. W. McCullagh, A. Fisher, J. E. Gething, W. A. G. Russell, A. McGrath, W. C. P. Barrett, T. L. Wormald, M. J. Petty, and E. Saxton (on account of ill-health).

Canadian Army Medical Corps: To be temporary Lieutenant-Colonels: G. E. Beauchamp, P. J. Decarie, and Z. Rheaume. Captains to be temporary Majors: J. G. Browne and P. K. Menzies. To be temporary Majors: J. O. Lacroix, G. Bourgeois, H. M. DuHamel, G. Archambault, J. A. Lussier, and A. N. Rivet. B. R. Almquest to be temporary Captain. Lieutenants to be temporary Captains: R. James Manion and C. R. Walsh. To be temporary Captains: R. Tessier, J. U. Gariepy, L. de G. Joubert, L. Collin, J. A. Lorrain, E. G. Dagenais, L. Blagdon, A. Larose, J. J. Trudel, P. P. Gauthier, J. E. N. DeHaitre, F. Demers, E. Mallette, A. Dumont, G. Lefebvre, J. W. Ladouceur, H. C. Clermont, J. B. Trudelle, J. A. Tousignant, J. McCaffrey, M. Dolbec, A. Lamontague, and A. J. Lafleur.

SPECIAL RESERVE OF OFFICERS.

Lieutenant O. D. Price to be Captain.

Lieutenants on probation confirmed in their rank: K. P. Brown, H. D. Wright, and W. H. Ferguson.

Ex-Cadet Sergeant H. S. Evans, Cambridge University Contingent, O.T.C., to be Lieutenant (on probation).

TERRITORIAL FORCE.

Royal Army Medical Corps.

Yorks Mounted Brigade Field Ambulance: To be Lieutenants: W. O'Brian, W. Cook, J. H. Paul, and R. S. Weir.

South Midland Field Ambulance: Major B. M. H. Rogers is seconded for duty at the Military Hospital, Bulford.

Welsh Field Ambulance: Major J. Evans to be temporary Lieutenant-Colonel whilst in command of a Field Ambulance. Lieutenant O. C. Sullivan to be Captain.

London General Hospital: Lieutenants to be Captains: W. K. Churchouse and J. A. Willett.

Western General Hospital: To be Captains, whose services will be available on mobilisation: O. W. Morgan, C. B. Gratte, and R. J. Coulter.

London Sanitary Company: W. F. Lanchester to be Lieutenant.

West Lancs. Field Ambulance: Captain (temporary Major) J. Wood to be Major. Captain R. Starkey-Smith, from London General Hospital, to be Captain.

Northern General Hospital: The transfer of Lieutenant-Colonel W. E. Hume to the Northumbrian Casualty Clearing Station is cancelled. Lieutenant-Colonel W. E. Hume is seconded for duty overseas.

Southern General Hospital: Captain W. S. V. Stock to be Major on the permanent personnel. The announcement of the seconding of Captain H. B. Whitehouse is cancelled.

Lowland Casualty Clearing Station: Captain R. B. Carslaw, from Scottish General Hospital, to be Captain. Captain R. B. Carslaw to be temporary Major whilst in command of a Casualty Clearing Station.

Lowland Division Sanitary Section: Captain H. L. P. Hulbert, from Divisional Sanitary Officer, South Midland Division, to be Captain.

Attached to Units other than Medical Units.—Lieutenants to be Captains: G. H. Rains and J. Muir.

PROMOTION IN THE INDIAN MEDICAL SERVICE.

The Government of India have sanctioned a proposal which will tend to some extent to relieve the grievance which has been felt by officers of the Indian Medical Service in comparing their rate of promotion with that obtaining under war conditions in the Army Medical Service. Lieutenant-Colonels of the Indian Medical Service, especially selected for the increased rate of pay, who are retained in the service on account of the war after attaining the age of 55, are now to be treated as supernumerary on the list, and promotions are to be made in their place with effect from the dates on which they attain that age. In the case of officers who have been granted extension to complete 30 years' service for pension, and who are similarly retained in the service, promotion is to be made from the date following that of the expiration of the period of extension.

Correspondence.

"Audi alteram partem."

A SUGGESTED CLASSIFICATION OF PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—During the last few years the country has set itself seriously to deal with the tuberculosis question, with the result that at the present time throughout the whole of England a very large proportion of the people suffering from this disease are being treated at recognised dispensaries approved by the Local Government Board and under the direct supervision of the local municipal authorities. In all these dispensaries records are kept, all more or less similar, differing only in detail and amplitude, which records, as they increase year by year, constitute a supply of clinical and social experience relating to the disease, from which it should be possible to extract much valuable information. But a great deal of this information will remain out of reach until we can find a suitable method of classifying the different types of pulmonary tuberculosis. Without such a uniform system of classification there can be no correlation of the results from different dispensaries in different areas, and no comparison of the efficacy or otherwise of different schemes or different treatments.

A classification of this nature must satisfy certain requirements. 1. It should state briefly but fully the exact clinical condition of the patient. 2. It should be so arranged that one heading should represent one type of case and one only. 3. It should depend upon easily obtainable *facts*, and be free of any possibility of variation due to the personal equation or bias of the classifier. So that two independent observers, classifying the patients attending X—— tuberculosis dispensary during 1915, will make out an identical table.

Our present classifications do not satisfy all these requirements. The Turban-Gerhardt classification is almost purely anatomical, depending on the extent of disease in the lungs. The class into which a patient is put depends largely on the personal opinion of the classifier; two equally experienced observers might easily differ in classifying a patient under the Turban-Gerhardt heads. Two patients may come under Turban-Gerhardt 3, the one dying and the other in good condition, with a prospect of many years of life. As an advance upon this we have Philip's classification, in which both the extent of the disease and the amount of systemic disturbance are taken into account. The symbols L and S are used to denote the extent of disease and the systemic disturbance, and they are graded by placing numerals against them; thus, L_1S_1, L_1S_2, L_2S_1, &c. This classification is a step in the right direction, but it does not fulfil requirement No. 3. It is not based on easily obtained *facts*, and therefore for the same set of patients two classifiers may easily make out widely varying lists. Probably the most useful classification we have at present is Inman's. He divides pulmonary tuberculosis into three stages entirely by the amount of systemic disturbance—using as his guide the temperature record. The three stages are: (1) Resting febrile; (2) resting afebrile, ambulant febrile; and (3) ambulant afebrile. This classification works well, but it still does not entirely satisfy our requirements. There are frequently met with cases with large areas of disease, a quick pulse, cardiac distress, and dyspnœa, but a normal temperature, in whom the prognosis is very bad. This type of case will have to come under Stage 3 and be classed with the man with a small lesion still well some years after sanatorium treatment. The great merit of his classification is that it is simple and is based on incontrovertible standards. There is also Walters's classification, combining the Turban-Gerhardt anatomical classification with symbols indicating the amount of constitutional disturbance. The criteria taken are pulse, temperature, and weight—gain or loss—by which the cases are tabulated in seven classes. An excellent but rather complicated classification, but open to criticism on two points: firstly, that it includes the Turban-Gerhardt stages, which are not sufficiently definite; and secondly, that it can be applied practically only to patients in institutions under direct medical supervision.

Proposed classification.—The function of the working man is to work, and the function of his doctor when treating him for pulmonary tuberculosis is so to handle him that he may have as many years of working life as possible. For this reason, when I was endeavouring to find some method of tabulating the results of treatment of tubercular patients, which would not include the dubious terms "cured," "improved," &c., I determined to use their capability or incapability to work as my standard. For this purpose I tabulated all cases into four divisions:—

Those who at the beginning of treatment during a given period—
(A) Were fit to work and remained fit.
(B) ,, unfit ,, ,, became fit.
(C) ,, fit ,, ,, ,, unfit.
(D) ,, unfit ,, ,, remained unfit.

This classification of results is simple, easily recorded, and, moreover, depends on facts. By combining it with Inman's classification I suggest that we have a classification satisfying all the requirements set forth above, and, further, a simple method of recording the history of the disease in any one case. To take an example, the history of an imaginary case can be recorded thus:—

1900. In_1C. (Hospital treatment.)	1904. In_3B.
1901. In_2B. (Sanatorium ,,)	1905. In_3A.
1902. In_3A.	1906. In_2C.
1903. In_3A.	1907. In_1D.
1904. In_2C. (Hospital treatment.)	1908. In_1. (Died.)

It has the merit of dividing up the only doubtful group under Inman's classification—namely, No. 3. A case put down under the heading In_3D can only be one in which symptoms due to the large extent of his lesion cause unfitness to work. A temperature of 99° F. may be taken as the limit between febrile and afebrile. The facts on which the classification depends are easily kept in the dispensary or sanatorium records, and trustworthy results can be obtained from them by independent observers.

It may be argued that for this classification some standard of work is necessary. But in practice I have not found this so. Most working patients are doing, at the time of their illness, that work which is most suited to their physique, and the clerk finds his work just as hard and tiring and likely to produce constitutional disturbance when he is on the downgrade as does the builders' labourer.

I am, Sir, yours faithfully,

R. C. WINGFIELD, M.B., B.Ch. Oxon., M.R.C.P. Lond.,
Medical Officer in Charge of the Tuberculosis Department, St. Thomas's Hospital.

May 1st, 1916.

INFLUENCE OF FEBRILE CONDITIONS ON INOCULATION AGGLUTININS.

To the Editor of THE LANCET.

SIR,—In reference to the letter on this subject by Dr. E. W. Ainley Walker in your issue of April 29th, the question which has been raised is this: Does the passage through a severe febrile condition markedly reduce or remove the inoculation agglutinins? It is obvious that this can only be answered by comparing the amount of agglutinin in inoculated persons who have passed through such an attack with the amount in those who have not. Professor Dreyer and his colleagues published tables composed exclusively of those who had passed through such attacks without any controlling results. I compared these with normal tables published previously by Professor Dreyer and the result definitely supported the presence of such an effect. Dr. Ainley Walker denies that the tables are comparable, on the ground of varying intervals since inoculation. These important data ought to have been stated in his tables but were not. At present Professor Dreyer has published no controls which can be used and hence none of the results given are, so far, reliable evidence.

Dr. Ainley Walker is under a misapprehension in his alternative plea that the manner in which the tables were compared exposes one to criticism. Firstly, I compared the arithmetical means; secondly, I gave the results according to his own standard of the presence of 25 agglutination units, an artificial standard; and, thirdly, I stated that any other comparison gave the same result. And this is so. For the comparison of two series composed of widely divergent numerical units, the truest method is to arrange the units in numerical order and compare the value of the middle term of each series. Suppose the group of series to be compared contained respectively p, q, r, &c., terms, p, q, r being odd integers, and the terms of each series being arranged in order of value. The most correct result is obtained by comparing the terms $\frac{p+1}{2}$, $\frac{q+1}{2}$, $\frac{r+1}{2}$, &c.

If p, q, r be even, the mean is taken between $\frac{p}{2}$ and $\frac{p}{2}+1$. Applying this method to Professor Dreyer's tables gives the following results:—

Normal typhoid inoculated persons	=	138	typhoid agglutination units.
Paratyphoid A occurring in typhoid inoculated persons	=	32	,, ,, ,,
Paratyphoid B ditto	=	75	,, ,, ,,
Other febrile conditions, ditto ...	=	44	,, ,, ,,

On their own contention that they have no controls, Professor Dreyer and his colleagues have thus published no evidence which can be applied to the question of whether a severe febrile condition markedly reduces the inoculation agglutinins. So far as their evidence goes, it supports the view. My own evidence does likewise. I do not contend that it is sufficient to prove it, but I have seen no evidence yet to the contrary. I may add that I ascribed no intentional discourtesy to Professor Dreyer and his colleagues at Oxford, but I am glad of their graceful disclaimer.

I am, Sir, yours faithfully,

Greywell, Bursledon, Hants, May 6th, 1916. H. L. TIDY.

THE STUDY OF APPLIED PSYCHOLOGY.

To the Editor of THE LANCET.

SIR,—Having now had an opportunity of reading the rules and prospectus of the Society for the Study of Orthopsychics, concerning which a letter from Dr. W. H. B. Stoddart appeared in your issue of May 6th, I find that it in no way meets the requirements set forth in my letter. The meetings for the discussion of papers are limited to four per annum, and the main object of the society is clearly the teaching of students. The syllabus could hardly have been better devised if it had been intended for students who have had an exhaustive training in science. I find, however, that members of the Child Study Society, Froebel Society, National Special Schools' Union, and London Teachers' Pedagogical Society are specially invited. The psychological experiment of putting such students through an elaborate course of this nature cannot fail to be profoundly instructive—to the teachers. It reminds me of the story of the clergyman who wrote to Huxley asking how he might best obtain a sound knowledge of the theory of evolution. He was recommended to take out a five years' course of study in chemistry, physics, and biology at a well-equipped college. This society will doubtless do useful work, but along different lines from those which I had in mind. Probably the time is not yet ripe for an independent Society of Applied Psychology. In that case it would be well that a nucleus should be formed under the ægis of some old-established society and safeguarded by its prestige. Perhaps the Royal Society of Medicine best fulfils these conditions, for I regard a thorough knowledge of physiology and pathology as of paramount importance.—I am, Sir, yours faithfully,

Queen Anne-street, W., May 13th, 1916. J. HERBERT PARSONS.

THE COMPOSITION OF EUSOL.

To the Editor of THE LANCET.

SIR,—Our attention has been directed to an error in calculation which has appeared in the papers on eusol published from this department.

The amount of free hypochlorous acid in the solution of eusol made up according to our recommendations was stated to be approximately 0·5 per cent.[1] This should read approximately 0·27 per cent. As we have uniformly stated the weights of the constituents to be used in making the solution this error does not in any way affect the validity of the results which have been recorded, but the point may have given rise to difficulty when solutions for intravenous injection were being tested by titration.

By following the directions given in our papers (viz., 12·5 gm. bleaching powder, 12·5 gm. boric acid to 1 litre of water) standard eusol is obtained of which in general

1 c.c. = 1 c.c. $\frac{N}{10}$ sodium arsenite solution.
= 0·00354 gm. chlorine
= 0·00262 gm. hypochlorous acid.

[1] THE LANCET, Feb. 12th, 1916, p. 360.

Slight variations from this standard occur, depending on the percentage of "available chlorine" in the bleaching powder. With the best samples the percentage of hypochlorous acid in the solution rises to 0·3, but bleaching powder of B.P. standard (30 per cent. available chlorine) gives 0 27 per cent. hypochlorous acid.

We are, Sir, yours faithfully,

Department of Pathology, University of Edinburgh, May 15th, 1916. J. LORRAIN SMITH. THEODORE RETTIE.

THE TREATMENT OF COLITIS AND PROCTITIS AND OF ULCERATION OF THE RECTUM AND COLON.

To the Editor of THE LANCET.

SIR,—I have been much interested in Mr. Aslett Baldwin's letter on the above subject in THE LANCET of May 6th. I have treated those cases for some time with ionisation with a 2 per cent. solution of zinc sulphate in the manner described by Mr. Baldwin. I use the same technique, except that I use a warm solution of bicarbonate of soda instead of the chloride of soda for damping the pad attached to the negative pole, and I bring the current slowly up to only 15 or 20 milliampères, as I find this is as much as a patient will usually tolerate. I allow the current to act for 10 to 15 minutes at each treatment, and I give two treatments a week.

I have been struck with the rapidity with which the condition responds to this form of treatment. The mucus and blood soon disappear from the stools, and one soon notes the disappearance of the colonic pain so frequently associated with the above conditions and which causes the patient so much distress. I am convinced that in ionisation we have a valuable remedy for the ailments which have proved so resistant to other forms of treatment.

I am, Sir, yours faithfully,

D. I. MENZIES-CONACHER, M.B., C.M. Edin.

Thurloe-place, S.W., May 16th, 1916.

THE SUPPLY OF MEDICAL OFFICERS TO THE SERVICES.

To the Editor of THE LANCET.

SIR,—I wish to suggest that the majority of doctors who do not join the army and navy should agree to treat, but during the war only, each panel patient for a sum not exceeding 20*s.* per annum. If a panel patient does not receive any treatment during the year no part of this 20*s.* would be paid, but if he receive treatment a yearly sum *not exceeding* 20*s.* shall be paid. A fee of 3*s.* 6*d.* to be paid for a day visit and 5*s.* for each night visit. The money required to be obtained out of the 7*s.* 6*d.* now paid to the panel doctor per annum, 5*s.* by the panel patient, and 7*s.* 6*d.* by the Treasury; doctors' fees to be paid quarterly.

What number of doctors would such an agreement provide for the army? In 1914 there were 32,772 doctors practising in the United Kingdom, not including 3356 army and navy doctors. Mr. Tennant lately stated in the Commons that there are now 10,659 doctors "holding commissions" in the army. Probably some of these are from the Dominions. But taking it that the great majority came from the United Kingdom, this leaves about 22,113. Supposing half of these were under the age of 45 this would qualify 11,056 more to join the army. These figures very much underestimate the actual conditions, as probably half of the 10,659, although "holding commissions," are engaged in medical practice at the same time or acting to local hospitals containing wounded troops. Moreover, not half of the 22,113 are over 45 years of age. We may, therefore, estimate that about 27,342 of the above total are now actually practising in the United Kingdom.

It has been said that one chief reason why more doctors do not join, is the panel system. Of a total of 29,875 doctors in England, Scotland, and Wales about 14,500 are panel doctors, thus giving 15,375 non-panel doctors of all ages. More than half of the panel doctors are well under 40 years of age. If, therefore, 7250 of these went abroad with the army and half of the non-panel doctors agreed to act on my proposal, this would still give about 14,937 to carry on the panel system.

I am, Sir, yours faithfully,

Liverpool. ROBERT R. RENTOUL, M.D.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Died.

Lieutenant J. J. Mackintosh, R.A.M.C., attached to the Essex Regiment, graduated M.B., B.Ch. Glasg. in 1908, and was in South Africa prior to joining the Royal Army Medical Corps in July, 1915.

Wounded.

Captain F. B. Winfield, R.A.M.C., attached to the East Yorks Regiment.

Captain E. J. Blair, R.A.M.C., attached to the Black Watch

Captain H. F. N. Scott, R.A.M.C.

Missing.

Captain W. R. O'Farrell, R.A.M.C.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Lieutenant C. J. McConaghey, Black Watch, son of the late Colonel J. McConaghey, Inspector-General of Hospitals, I.M.S.

Commander B. L. Owen, fourth son of the late Dr. A. Ll. Owen, of Southsea.

Lieut.-Col. C. A. Madge, South African Imperial Force, fourth son of the late Dr. H. M. Madge, of Upper Wimpole-street, London

The following met death during the Irish rebellion:—

Colonel H. Allatt, late Duke of Cornwall's Light Infantry, son of the late Dr. C. K. J. Allatt.

THE HONOURS LIST.

His Majesty the King has conferred the *Distinguished Service Order* upon—

Captain Robert McCowan Hill, R.A.M.C. (attached to the 2nd Argyll and Sutherland Highlanders).

For conspicuous gallantry and devotion to duty. He went to an area which was under intense bombardment, amputated the leg of a wounded officer, and attended to other wounded under most difficult and dangerous circumstances. Finally he accompanied two stretcher cases back under shell fire.

The *Military Cross* has been conferred upon—

Captain James Lennox Stewart, R.A.M.C. (attached to the 1st Gordon Highlanders).

For conspicuous gallantry and devotion to duty on several occasions when tending the wounded under heavy fire. On one occasion he rallied men and set a splendid example of coolness and bravery.

FOREIGN DECORATIONS.

The following foreign decorations have, with the approval of His Majesty the King, been conferred upon the following members of the Royal Army Medical Corps Mission to Serbia, March to June, 1915:—

Order of St. Sava.

Capt. N. Cameron, 5th Class.
Capt. J. M. Clements, 5th Class.
Capt. B. C. Ewens, 5th Class.
Capt. A. K. Forbes, 5th Class.
Capt. C. M. Forster, 5th Class.
Capt. J. M. Hill, 5th Class.
Col. W. Hunter, C.B., 2nd Class.
Capt. S. W. Lund, 4th Class.
Capt. S. E. McClatchey, 5th Class.
Capt. C. R. Nicholson, 5th Class.
Capt. T. H. Ravenhill, 5th Class.
Capt. H. Y. Riddell, 5th Class.
Capt. J. H. V. Scott, 5th Class.
Capt. P. J. A. Seccombe, 5th Class.
Capt. B. M. Smith, 5th Class.
Capt. C. E. H. Smith, 5th Class.
Capt. R. H. Spittal, 5th Class.
Lt.-Col. G. E. F. Stammers, 3rd Class.
Capt. L. A. Walker, 5th Class.
Capt. E. S. Walls, 5th Class.
Capt. G. Whittington, 5th Class.
Capt. J. S. Williamson, 5th Class.
Capt. W. M. Will, 5th Class.
F. F. Brown (late Lt., R.A.M.C.), 5th Class.
W. W. C. Topley (late Capt., R.A.M.C.), 4th Class.

THE WAR MEDICAL AND FIRST-AID EXHIBITION.

—The War Medical and First-Aid Exhibition, which was to have been held at the Royal Horticultural Hall, Vincent-square, Westminster, from Monday, May 22nd, to Friday, May 26th, has, with the consent of the Minister of Munitions, been postponed to July 25th to 28th inclusive.

OBITUARY OF THE WAR.

FRANCIS COURTENAY LAMBERT, M.R.C.S., L.R.C.P. LOND.,

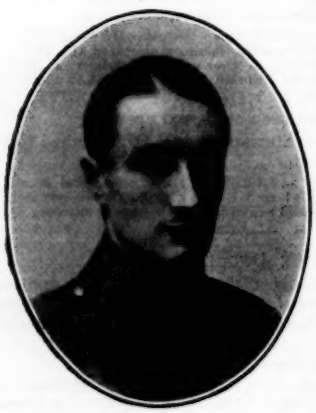
MAJOR, ROYAL ARMY MEDICAL CORPS.

Major F. C. Lambert died from paratyphoid fever at Kut-el-Amara on March 29th. He was born at Dover in 1879, and was the eldest son of Lieutenant-Colonel Lambert, late of the Royal Marine Artillery, of Branksome Park, Bournemouth. He received his education at Cheltenham, and in 1896 became a student at St. Mary's Hospital, London, graduating M.R.C.S., L.R.C.P. Lond. in 1902, and later filling the post of house surgeon at St. Mary's Hospital. Major Lambert took a great interest in the Volunteers, holding at one time the position of staff sergeant in the medical branch, and gaining the Jubilee medal. He joined the Royal Army Medical Corps in 1904, and served throughout the campaign in Mesopotamia, his name being mentioned in despatches four times. He married Nora, only child of the late Colonel Druitt, of the Munster Fusiliers, and of Mrs. Druitt, of Huntly, Parkstone, Dorset.

REGINALD KINLOCH MACGREGOR, M.R.C.S., L.R.C.P. LOND.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain R. K. MacGregor, who was accidentally killed in France on April 23rd at the age of 28, was the only son of Dr. and Mrs. R. D. MacGregor, of Clerkenwell, London. He was educated at Edinburgh and at University College School, London, and was a medical student at St. Bartholomew's Hospital, qualifying M.R.C.S. and L.R.C.P. in 1911. When the war broke out he joined the Royal Army Medical Corps and crossed over to France with the first Expeditionary Force, being promoted Captain at the end of the first year. A near relation writes: "Few men of his years have left so many warm and devoted friends. He was of a singularly gentle, kindly, and constant nature, and all who knew him feel that his untimely death has robbed them of a friend they will sorely miss."



WILLIAM RUDOLF CENTER, M.B., C.M. EDIN., M.R.C.S., L.R.C.P. LOND.,

FLEET-SURGEON, R.N.

Fleet-Surgeon William Rudolf Center, of H.M.S. *Russell*, who died in the Royal Naval Hospital, Malta, from wounds received when the ship was sunk on April 28th, was the only son of Lieutenant-Colonel William Center, I.M.S., and grandson of the late Rev. William Center, Longside, Aberdeenshire. Born in India in 1871, he received his early education in Aberdeen and Charterhouse, and then proceeded to Edinburgh University, where he graduated in medicine in 1893 with honours, and later took the M.R.C.S., L.R.C.P. Lond. He entered the Navy in 1896, and his first commission was in H.M.S. *Fox* in West Africa. He was in the *Ramillies* in 1901 and also in the *Cambrian* on the Australian station in 1905. He married Zoe Clara, daughter of the Rev. Bennett Blakeway, Harton Vicarage, Leek, Staffs, but leaves no family.

TYPHUS FEVER AT PRISONERS' CAMPS IN GERMANY.

The attention of the public in this country has recently been drawn to the occurrence of typhus fever in Germany through the narration of the events that transpired at the prisoners' camp at Wittenberg, and the exhibition of callousness to suffering and brutal inhumanity displayed by the Prussian officials towards the unhappy fever-stricken English prisoners of war. In this connexion the experience of two captured French military surgeons is of interest, their story having recently been published in the *Revue d'Hygiène*. From this it appears that typhus was epidemic during the first half of 1915 in two camps in which prisoners of war were incarcerated—namely, at Langensalza and Niederzwehren, both of which are situated in Prussia. The conditions in these camps were very bad, especially at the former, where the overcrowding was very great and the facilities for personal cleanliness quite inadequate. Before long every prisoner became infested with lice, which swarmed in the hair of the head, the pubis and the axillæ, as well as upon the clothing of the men. In December, 1914, the Germans adopted the system of intermingling the Russian with the French prisoners in the huts with a view, as they cynically said, of enabling the Allies to become better acquainted with each other. It is believed that the typhus infection was introduced by the Russians, and the spread was facilitated undoubtedly by the terrible conditions existing in the camps. Within a month after the mixing of the prisoners typhus broke out, and continued to be epidemic at Langensalza till May and at Niederzwehren till July. No attempts were made at first by the Prussian officials to arrest the progress of the epidemic, and it was not until some of the German soldiers guarding the camp had been attacked that isolation of the sick and disinfection of the vermin-infested clothing was begun. The two French medical officers, Surgeon-Major Deléarde and Auxiliary Surgeon D'Halluin, can give no precise figures as to the total number of typhus cases and deaths in the two camps, but they give some approximation to the numbers at Niederzwehren. This camp was divided into four "blocks" of hutments accommodating altogether 20,000 prisoners (roughly 12,000 Russians and 8000 Frenchmen). In the "block" to which they were attached for medical purposes there occurred 1834 typhus cases, and they estimate that during the height of the epidemic 5000 fever cases were under treatment in the four blocks. There were in all 67 captive French and Russian medical officers in this camp and 20 of them were stricken down with typhus. In one of the blocks 138 volunteers of both nationalities attended as orderlies on the sick, and 96 of this number contracted typhus. There was a considerable mortality, but definite figures cannot be given. The average strength of the French prisoners during the first half of 1915 was 7131, and among them there were 987 deaths during the period, the majority being from typhus; but others also occurred from pulmonary tuberculosis, diphtheria, pneumonia, neglected wounds, and general misery arising from the privations of all kinds to which the unfortunate prisoners were exposed. The etiology of typhus is discussed by Dr. Deléarde and Dr. D'Halluin, who agree that the usual means of contracting the disease is through the bites of infected lice; but they urge attention to another mode of spread which, though not so frequent, should not be ignored—namely, through the expectoration coughed out in the form of spray by the typhus patient. Coughing is common in the early stage of typhus, and the doctor or the nurse is liable to receive the droplets coughed out by the patient full in the face. Comparison is made between typhus fever and plague, in both of which the virus is commonly conveyed to man by the agency of a biting insect. But in typhus, as in pneumonic plague, the virus may be conveyed from the infective secretions of the respiratory passages, through coughing, to healthy persons within short range. An illustrative example is quoted. A captive French doctor was only five days at Langensalza camp, and on one occasion, the day before he was transferred to Niederzwehren, he visited some typhus cases, but only examined a single one,

who, however, coughed in his face. On arrival next day at the second camp he took all precautions, wearing special garments while at the sick beds, changing his under-linen twice daily, as well as lathering himself all over with a medicated soap once a day. He, however, developed typhus 12 days after leaving Langensalza camp.

CENTRAL MEDICAL WAR COMMITTEE.

A meeting of the Central Medical War Committee was held on Wednesday, May 17th, when further debate took place as to the position of the Committee under the new arrangements for compulsory military service. The position of the Committee has throughout been that if the War Office requires any selection of men to accept medical commissions, and if the War Office agrees that such selection can only be done by a professional body, the Committee will accept the responsibility, while making it perfectly clear that it was one which they had not sought. The united sense of the Committee, after discussion, was that all qualified doctors coming under the action of the new Military Service Act should be referred to the Committee, or some professional body, except those who are refusing to serve on conscientious grounds. Claims for exemption from service in the Royal Army Medical Corps or to have commissions in that corps would thus be considered by a professional body, with the result that individual medical men, as well as the medical men in different localities, would have the best chance of securing a just hearing of their representations, while certainly the risk of depleting particular neighbourhoods of medical practitioners would be avoided.

ENLISTMENT OF CONSUMPTIVES.

We are glad to note that the Local Government Board has taken the step of instructing medical officers of health to furnish the Army Council with particulars of tuberculosis notifications. The list is to include all male persons who on Jan. 1st of the present year were between the ages of 18 and 45, and who had been notified since Feb. 1st, 1913, as suffering from tuberculosis. It is obvious that this information is essential in order to avoid enlisting for active service men who have had a recent attack of tuberculosis and who are likely to break down sooner or later under the stress of prolonged exertion.

BENEVOLENT FUNDS FOR THE SERVICES AUXILIARY TO THE ROYAL ARMY MEDICAL CORPS.

We have already called attention to the proposal for establishing some kind of benevolent organisation for the benefit of the families of medical officers in the Special Reserve, the Territorial Force, and the new armies. A meeting, to be presided over by the Director-General, will be held in the Royal Army Medical College, Grosvenor-road, S.W., at 2.45 P.M., on Thursday, June 1st, at which it is hoped there will be a large attendance of officers now serving.

ENROLMENT OF SCHOOL MEDICAL OFFICERS.

The Secretary to the Board of Education has sent a circular to the local education authorities asking for an immediate return of all medical officers on the staff of the School Medical Service who have not attained the age of 45 years. The Board of Education considers that in the event of a temporary curtailment of the service becoming necessary provision should at any rate be made for the medical inspection of children of all ages who appear to be ailing, and for the maintenance of any treatment at present being undertaken. The Board advises that all the officers should enrol under the scheme of the Central Medical War Committee, irrespective of whether they can be spared or not. A commission will in no case be granted except with the consent of the local education authority and the approval of the Board of Education.

PHYSICAL CLINIQUE FOR WOUNDED AND DISABLED SOLDIERS.—The committee formed to organise a combined physical treatment for wounded and disabled soldiers in London has now issued an appeal. The methods—hyperthermal, whirlpool, and other local baths, massage and mechanical movement by means of special apparatus—have been already described in THE LANCET of Feb. 5th and 12th and March 25th. The conditions which are claimed to be amenable to a skilful combination of such methods include the common sequelæ of wounds and operations—viz., defective circulation and swelling, painful scars, weak and contracted muscles, and, above all, in very many cases, stiffness and immobility of joints. The reports already published show the favourable nature of the results obtained in France from purely physical methods of this kind following hospital and surgical treatment. By private generosity a complete installation of special baths and necessary apparatus has now been provided, and will shortly be set up in rooms at 126, Great Portland-street, London, W., where accommodation will be provided for the treatment of 60 patients per day at an estimated weekly expenditure of £30. The committee hope to open this clinique at the beginning of June. Treatment will be given free of charge and in the first instance to officers only. The appeal is now made for a minimum sum of £1500 to cover the first six months' expenses. Donations should be sent to the treasurer, Mr. A. Louis Allen, 1, St. James's-street, London, S.W.

EDINBURGH ADVISORY COMMITTEE FOR WOMEN'S WAR EMPLOYMENT.—The Board of Trade have appointed the following members to form an Edinburgh and Leith Advisory Committee for Women's War Employment:—President, Lord Provost Sir Robert K. Inches; Chairman, Provost Malcolm Smith (Leith); Mrs. A. Adams, Mr. Neil S. Beaton, Mr. James Campbell, Miss G. G. Cowan, Mr. James Currie, Mr. W. Fraser Dobie, Councillor W. Graham, Mrs. Jane E. Hannay, Mr. J. Milne Henderson, Hon. Mrs. Hope, Mrs. Helen L. Kerr, Miss Alice Low, and Miss Ethel Whalley.

A NEW CANADIAN HOSPITAL IN LONDON.—Princess Louise opened on May 11th a hospital of 25 beds for Canadian officers at 1, Hyde Park-place. The hospital has been generously equipped by Colonel and Mrs. A. E. Gooderham, of Toronto, and is to be maintained by the Canadian Red Cross. Captain Creighton, Canadian A.M.C., is in charge. Colonel Hodgetts stated on behalf of the Canadian Red Cross that after the war the furniture of the hospital will be handed over to the British Red Cross for the Star and Garter.

THE GAZETTE OF THE 3RD LONDON GENERAL HOSPITAL.—The Gazette in its May issue is again able to boast that the whole of the literary and artistic contents has been supplied from the hospital. The contributions, which maintain their previous standard, are by past and present patients or members of the staff. This issue has portraits of Sir Alfred Keogh, Sir James Kingston Fowler, and Sir Alfred Pearce Gould.

THE MILLER GENERAL HOSPITAL FOR SOUTH-EAST LONDON.—Through the generosity of Mrs. Almeric Paget this institution has been enabled very largely to extend its massage and electrical department. The Almeric Paget Massage Corps is doing most valuable work in military hospitals and camps, the organisation being carried out by the Hon. Essex French, the daughter of Field-Marshal Lord French.

THE WOUNDED ALLIES RELIEF COMMITTEE.—At the War Fair at the Caledonian Market, N., on June 6th and 7th, in aid of the funds of the Committee, any odd cups, saucers, vegetable dishes, table glasses, &c., will be welcomed. Many house-wives must have in their possession odd pieces of china for which they have no further use, and which they will be glad to get rid of, and others may be glad of an opportunity to purchase missing pieces.

NORFOLK WAR HOSPITAL MAGAZINE.—We have received the first two numbers of the *Norfolk War Hospital Magazine*, a monthly publication, which, while directed to the staff and patients, should interest an outside public. It is well edited, and in addition to hospital news contains amusing illustrations, some good quips, and some sober thinking. The profits from the sale of the paper are devoted to extra comforts for the patients, and the magazine can be obtained direct from the hospital or the Norwich bookshops.

Obituary.

J. WILLIAM WHITE.

EMERITUS PROFESSOR OF SURGERY AT THE UNIVERSITY OF PENNSYLVANIA.

Dr. J. William White, emeritus professor of surgery at the University of Pennsylvania, died on April 24th from malignant disease of the spine, in his sixty-sixth year. The news will come as a shock to his many English friends who saw him last year overflowing with vitality and enthusiasm in the cause of the Allies in the great war.

After graduating in medicine at the University of Pennsylvania in 1871, White, who had only just attained manhood, accompanied Professor Agassiz in a scientific expedition to South America. On his return he became associated with the Philadelphia Hospital as assistant to the late Professor Agnew, whom he eventually succeeded in the chair of surgery in 1900. A widely equipped surgeon, he wrote extensively on genito-urinary diseases; devised the well-known operation called after him; was joint author of the "American Text-book of Surgery" and of the "Text-book of Genito-Urinary Surgery"—both very successful publications. He was also a strong believer in the athletic life, was a champion swimmer and boxer, and was probably the last man in America to fight a duel. The prominent position taken of late years in athletics by the University of Pennsylvania is largely due to his exertions.

Few Americans have been more warmly welcomed in England, where he had many friends, the circle of whom had been greatly extended of late by his ardent advocacy of our cause. With characteristic energy, he strove from the very outbreak of hostilities to place the clear issue between Liberty and Absolutism before his fellow countrymen. His "Primer for Americans," in its more expanded form "A Text-book for Americans," had a large sale, and the briefer version has been translated into neutral languages and widely disseminated. White delighted in nothing more than a fight, and he gave the hyphenated Americans no quarter. He went to France with the University of Pennsylvania unit for the American Ambulance, and everyone was impressed by his extraordinary virility. He saw all and did everything that was possible to a neutral, and his firm conviction in the justice of the cause for which this country is fighting was reinforced by all that he heard and experienced.

THE LATE DR. CHARLES JOHN GIBB.—Dr. C. J. Gibb, who was consulting surgeon to the Newcastle-on-Tyne Royal Infirmary, died at his residence in Newcastle on May 13th, in his ninety-third year. He was the son of Mr. John Gibb, who practised as a surgeon in Newcastle for nearly 40 years. After studying at the College of Medicine in his native town he qualified with the M.R.C.S. and L.S.A. in 1847, graduating M.D. at Durham University in 1859. Dr. Gibb was in practice for over 60 years, and at one time was a lecturer on pathology, physiology, and anatomy in the Newcastle-on-Tyne College, where he was also examiner in pathology. During the cholera epidemic in Newcastle in 1853, when over 1500 deaths were recorded, Dr. Gibb took a prominent part, and afterwards he wrote a report on epidemic cholera as it appeared in the Royal Infirmary.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—An ordinary meeting of the Council was held on May 11th, Sir W. Watson Cheyne, the President, being in the chair.—Fleet-Surgeon Percy William Bassett-Smith, C.B., and Mr. James Frank Colyer were introduced, and, after signing the by-laws and making the required declaration, were admitted Fellows of the College.—It was resolved, in accordance with a report from the Court of Examiners, to issue Diplomas of Membership to 99 successful candidates.—On a report from the Cartwright Prize Committee the following was chosen as the subject for the five years ending Dec. 31st, 1920: "The Treatment of Injuries of the Jaws and the Restoration by Mechanical Means of Parts of the Jaws Lost as the Result of Injury or Removed on Account of Disease." It may be mentioned that the Cartwright prize consists of a bronze medal and £85, and that it is awarded every five years.

At the Primary Fellowship Examination in Anatomy and Physiology of the Royal College of Surgeons of England, held on May 3rd, 4th, and 9th, 34 candidates presented themselves of whom 11 were approved and 23 were rejected. The following are the names and medical schools of the successful candidates:—

Francis Cooke Alton, St. Thomas's Hospital; Gerald Victor Wright Anderson, Bristol University and University College Hospital; John Myles Bickerton, Cambridge University; Horace Braithwaite Bullen, Cambridge University and St. Bartholomew's Hospital; Dorothy Gilford, London School of Medicine for Women; Ronald Benjamin Green, University College; Arthur James McNair, Cambridge University and Guy's Hospital; Ludlow Murcott Moody, King's College; Rowland John Perkins, St. Bartholomew's Hospital; Henry Brett Russell, St. Thomas's Hospital; and Jose Victory, Costa Rica and Guy's Hospital.

The Licence in Dental Surgery was conferred on May 11th upon—

Christopher Hodgson Pywell, Middlesex and National Dental Hospitals.

THE NATIONAL MEDICAL UNION.—At a special general meeting of the National Medical Union, held at 346, Strand, on May 16th, Mr. V. T. Greenyer presiding, a resolution was passed condemning unanimously the action of the Local Government Board in attempting to effect any reduction in the fees paid to the medical profession for the notification of infectious diseases. At the same meeting the Union passed a resolution hoping that the Government would reduce the duty on motor-car licenses payable by the medical profession to the scale of 1915; while a third resolution urged the Government to supply the medical profession with petrol at as low a cost as possible, noting with regret that the arrangements for the supply had been placed in the hands of the National Health Insurance Commission.

SUMMER TIME ACT, 1916.—In accordance with the provisions of the Summer Time Act, 1916, popularly known as the Daylight Savings Bill, the time on all railways, at all post offices and other Government establishments will, in the night of Saturday-Sunday, May 20th-21st, at 2 A.M., be put forward one hour to 3 A.M. The public is requested to follow suit by putting forward all clocks and watches by one hour during the night in question. Normal time is to be restored on the night of Sept. 30th. For astronomical, meteorological, and nautical purposes the time remains unaltered.

ASYLUM WORKERS' ASSOCIATION.—The annual general meeting of this association was held on May 17th at the rooms of the Medical Society, Chandos-street, W., under the presidency of Sir John Jardine. It was stated in the annual report that up to May, 1915, considerably more than 2000 attendants in asylums in England and Wales had joined the colours, not including numerous clerks and artisans. Since that time practically all the remaining workers of military age had presented themselves under Lord Derby's scheme. The membership of the association at the time the report was issued numbered 2626, including 316 life members, 213 associates, and 2097 ordinary members.

DR. EDITH PECHEY PHIPSON POST-GRADUATE SCHOLARSHIP.—This scholarship, of the value of £40, is awarded annually in June by the Council of the London (Royal Free Hospital) School of Medicine for Women, who are the trustees of the scholarship. It is open to all medical women, preferably coming from India, or going to work in India, for assistance in post-graduate study. The scholarship may, at the discretion of the trustees, be held by one recipient for a term not exceeding three years. Forms of application can be obtained from the secretary of the school and must be filled in and returned by May 31st each year.

LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.—The annual general meeting of members of this society was held at the offices, Craven-street, Strand, on May 3rd, Dr. C. Owen Fowler (deputy vice-chairman of the council) presided. The chairman, in proposing the adoption of the report of the council and balance-sheet and statement of accounts, after referring to the loss which the society had sustained by the death of Dr. G. A. Heron, the President, said that Sir John Rose Bradford had consented to act as the new President. Their funds, said Dr. Fowler, had suffered from two causes: first, the young medical men qualifying during the last 18 months had immediately joined the army, with no time to think of what risks they were going to incur and no idea of the necessity of any kind of insurance in this way, and secondly a certain number of the members, having joined the army, had not been able to see that they would require any help from the society and had retired. It had been decided that if members resigned whilst on temporary military duty, the council would readmit them as members without the usual entrance fee, while should they be in arrears with their subscription, they could continue membership on paying up those arrears. Dealing with the administration of the National Insurance

Act, the chairman said that the tendency of the Commissioners and Insurance Committees to usurp unjustified powers over medical practitioners needed to be combated. With regard to the outlook of the profession, he said that midwives did 70 per cent. of the midwifery, and school clinics looked after the children when they went to school, and there were baby-shelters and the like. Then tuberculosis dispensaries looked after tuberculous cases; infectious hospitals took all the infectious cases. Measles could be treated at home by the medical officer of health, who would send round to see that the cases were properly nursed. Practice under the Insurance Act was paid for at a certain rate, and there was no dependence that the rate would be maintained for the future. Drug expenses were increased, petrol had gone up enormously, and a tax had been put on motor-cars. "And the irony of the circular from the Treasury asking us to place all our savings in Exchequer Bonds, so that they can take five shillings more out of every pound," he continued, "is that they speak of it as a tax on *unearned* income." The financial position of the society was described as "stronger this year." In 1913 it seems there was a favourable balance of over £11,600, in 1914 £13,600, and in 1915 nearly £16,000. Sir John Rose Bradford was unanimously elected President of the society, and all the vice-presidents were re-elected, as well as three of the retiring members of council and Mr. J. Herbert Parsons to take the place of the fourth. Major C. M. Fegen was re-elected treasurer, Dr. Hugh Woods general secretary, and Captain A. G. R. Foulerton financial secretary.

ROYAL SOCIETY.—The Bakerian Lecture on X Rays and the Theory of Radiation will be delivered by Professor C. G. Barkla, F.R.S., at Burlington House, London, W., on Thursday next, May 25th, at 4.30 P.M.

SOLDIERS' AND SAILORS' DENTAL AID FUND.—This fund was started on Dec. 21st, 1914, with the object of giving dental aid to sailors and soldiers and recruits in order to fit them for active service. In the first annual report just issued it is shown that applications for help had been made by 10,787 applicants, surgical treatment being given in 8900 cases, double dentures provided in 1366 cases, and single dentures in 410 cases. In 111 cases it was not possible to give assistance. The address of the fund is 43, Leicester-square, and the bankers are Messrs. Barclay and Co.

DONATIONS AND BEQUESTS.—Under the will of the late Sir Andrew Richard Scoble, P.C., K.C., K.C.S.I., of Wimbledon, M.P., the testator left £5000 to King Edward's Hospital Fund, and a similar amount for the maintenance of the convalescent home, orphanage, and other charitable works carried on by the Sisterhood of St. John the Baptist at Clewer. By the same will the Ramsgate General Hospital and Seamen's Infirmary will receive £1000.—By the will of the late Mr. Edgar Allen the University of Sheffield will receive £32,000.—Further donations amounting to £4000 have been given to Cardiff Hospital by the South Wales coal-owners, making £16,000 in all.

SOUTH LONDON HOSPITAL FOR WOMEN.—This new hospital, the building of which was begun four years ago at South Side, Clapham Common, will be opened on July 4th by Her Majesty the Queen. Though the actual cost of building has been defrayed by generous donors, money is required to equip and maintain the hospital, and the board of management are appealing for funds for this purpose. The address of the secretary is 88 and 90, Newington-causeway, S.E., and the bankers are Messrs. Cocks, Biddulph and Co., 43, Charing Cross, S.W.

MEDICAL SOCIETY OF LONDON.—At a meeting of this society held on May 15th, Lieutenant-Colonel W. Pasteur, the President, being in the chair, the following officers were elected for the session commencing in October, 1916. President: Mr. D'Arcy Power. Vice-Presidents: Dr. G. N. Caley, Mr. W. H. H. Jessop, Sir Anderson Critchett, Bart., and Dr. A. E. Garrod. Treasurer: Dr. J. Mitchell Bruce. Librarian: Dr. A. F. Voelcker. Honorary Secretaries: Mr. Hugh Lett and Dr. W. J. Fenton. Honorary Secretary for foreign correspondence: Dr. H. R. Spencer. Council: Mr. Donald Armour, Dr. R. Armstrong-Jones, Dr. F. F. H. Bateman, Sir John Broadbent, Bart., Mr. H. W. Carson, Sir David Ferrier, Dr. H. M. Fletcher, Dr. B. E. Goff, Mr. H. T. Gray, Mr. J. D. Malcolm, Dr. F. W. Mott, Dr. W. Pasteur, Dr. D. L. Roberts, Dr. J. H. Stowers, Mr. E. H. Shaw, Mr. R. J. Swan, Sir StClair Thomson, Mr. Wilfred Trotter, Dr. H. D. Waugh, and Dr. R. A. Young.

DUBLIN HOSPITALS AND THE REBELLION.—Several of the boards of governors of Dublin hospitals, who have held meetings in the past week or two, have passed resolutions of special thanks to those to whom they were indebted for the extraordinary services required in Easter week. These resolutions embrace not only the medical and nursing staffs of the hospitals, but in many cases outside medical men who willingly offered their services, traders and friends who at much risk to themselves supplied provisions, and the very many helpers, medical, clerical, and lay, who carried the wounded to hospital and gave assistance in a multitude of ways. No incident in the recent unfortunate events has been more remarkable than the way in which the city hospitals met every call made upon them, while at the same time they received every support from a host of friends.

THE WELSH NATIONAL MEDICAL SCHOOL.—At a recent meeting of the board of management of the King Edward VII. Hospital, Cardiff, it was announced that the plans of the complete medical school had been approved by the Chancellor of the Exchequer.

WOMEN'S IMPERIAL HEALTH ASSOCIATION.—One of the objects of this association is to teach the women of the Empire the elementary principles of health, particularly with reference to the care and nurture of children, and the sixth annual report affords evidence that much good work has been done in this direction. By the establishment of infant welfare centres, mothercraft exhibitions, and conferences, and in other ways women have been taught to look after their own health and that of their children—things of primary value to the nation at any time, and particularly so at the present moment. Subscriptions should be sent to the honorary treasurer, Captain E. M. Corner, R.A.M.C. (T.) (acting honorary treasurer, the Lady Chelmsford), at the Women's Imperial Health Association, 7, Hanover-square; or to Parrs' Bank, Regent-street, W.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Medical Re-examination of Rejected Recruits.

ONE of the points to which Parliamentary criticism was directed in the debates on the Military Service Bill was the provision in Clause 3 under which men who had previously been rejected as medically unfit for the army were made liable to re-examination. One of the subsections of the clause laid down that the exemption given under the earlier Act "shall on August 1st, 1916, cease to apply to a man who has offered himself for enlistment and been rejected since August 14th, 1915, unless the Army Council are satisfied that he need not again present himself for medical examination, and send him notice to that effect." Mr. LONG, the President of the Local Government Board, who was in charge of the Bill, was asked to explain the methods of selection to be employed in re-examining these men. The right honourable gentleman recapitulated the reasons which had induced the Government to adopt re-examination. He stated that in the pressure of the recruiting rush medical examinations were in a great many cases cursory and unsatisfactory. A great many of the certificates of unfitness were valueless, because they were insufficient for identification purposes. Moreover, it was now practicable to employ in the army men who, although they might not be fit to go to the front trenches, could discharge duties hitherto performed by men of full military fitness. Under these circumstances, the Government thought it right to review the fitness of men who had been formerly rejected. Before the Committee passed the clause it was amended in one particular. As it originally stood it placed an onus on the man to present himself for re-examination, unless specifically released. As amended the onus is shifted to the military authorities to require the man to present himself for re-examination. In the revised form the provision lays down that the exemption from service shall cease only "if the Army Council are satisfied that he should again present himself for medical examination, and send him notice to that effect."

In the course of the report proceedings Mr. TENNANT (Under-Secretary for War) stated that the War Office proposed to issue instructions to the recruiting officers to the effect that men who had been rejected at the primary military examination or subsequently by the medical board, and whose rejection was recorded in the military register, would not be called up for medical re-examination. He promised to see whether notices could not be sent at a reasonably early date informing medically rejected men whether they would be required to submit themselves to re-examination.

HOUSE OF COMMONS.

WEDNESDAY, MAY 10TH.

Treatment of Jaw Injuries to Soldiers.

Mr. PENNEFATHER asked the Under Secretary for War how many hospitals there were in this country where jaw injuries which had been suffered by our soldiers could be

treated by general surgeons and dental surgeons acting in concurrent collaboration, and how many of such hospitals had been established by the French surgical and dental authorities; and whether he was aware that serious jaw injuries could be better treated by general surgeons and dental surgeons acting in concurrent collaboration than by ordinary surgical treatment.—Mr. TENNANT answered: In all hospital centres arrangements have been made for jaw injuries to be treated by general surgeons and dental surgeons acting in concurrent collaboration. As regards the last part of the question, my medical advisers are fully aware that cases of the kind in question are best treated by surgeons and dental surgeons acting in collaboration.

Dental Surgeons in the Army.

Mr. PENNEFATHER asked the Under Secretary for War how many qualified dental surgeons had been recruited for combatant service instead of for service as dental surgeons; whether qualified dental surgeons were still being recruited for combatant service; and, if so, whether, having regard to the efficiency of the army, he would consider the advisability of employing such men as dental surgeons rather than as combatants.—Mr. TENNANT replied: I cannot give the figures asked for in the first part of the question. The answer to the second part is in the affirmative. As regards the third part I can assure the honourable Member that full provision for dental surgeons for the army has been made, and that all demands to such service for the troops, both at home and abroad, have been supplied. Further, there is a very large number of applicants for dental commissions, and no difficulty is anticipated in meeting any demands which may remain.

Mr. PENNEFATHER asked the right honourable gentleman to state the proportion of dental surgeons in the British army as compared to the number of men, and the proportion in the Canadian forces and in the French forces.—Mr. TENNANT answered: I cannot, I think, give the proportion asked for in the first part of the question, as it would be easy to deduce from it information available to the enemy regarding the total strength of the army. The War Office do not possess the information asked for in the last part of the question.

Invalid Prisoners of War.

Mr. MALCOLM asked the Under Secretary for War whether, in order to save time, he would instruct the medical officers in all prisoner camps in Great Britain to prepare a list of those invalid prisoners of war who, in their opinion, should be sent to Switzerland, subject to the confirmation of that opinion by the commission of neutral doctors when they arrived.—Mr. TENNANT said in reply: What my honourable friend suggests has already been done.

Certifying Surgeons.

Mr. LEWIS HASLAM asked the Home Secretary whether in order to save £12,500 per annum the Retrenchment Committee had reported in favour of the discontinuance of the services of certifying surgeons in connexion with factories and workshops; and, if so, whether in view of the number of inexperienced persons employed at the present time in occupations in which accidents were likely to occur he would inquire into the question of the desirability or otherwise of the adoption of this recommendation.—Mr. H. SAMUEL wrote in reply: The recommendation of the Committee extends only to reports on accidents and not to the whole duties of the surgeons. The question was investigated by the Departmental Committee on Accidents in 1911, and I do not think further inquiry would throw any fresh light on the subject.

Mr. NEEDHAM asked the right honourable gentleman whether it was his intention to take evidence before introducing legislation to dispense with the reports of certifying surgeons on accidents, based on the recommendation of paragraph 27 of the Retrenchment Committee.—Mr. SAMUEL (in a written answer) replied: This proposal has been considered by two committees, the Departmental Committee on Accidents and the Retrenchment Committee. I do not think further inquiry is called for, but I have had the advantage of meeting the representatives of the certifying surgeons and hearing a full statement of their views.

THURSDAY, MAY 11TH.

Non-poisonous Dope.

Mr. BOWERMAN asked the Under Secretary for the Home Department whether, in view of the recent fatalities which had occurred from the use of dope in aircraft works, he was aware that private makes of dope free from the poisonous spirit known as tetrachlorethane, which were claimed to be entirely non-poisonous, were freely advertised and might presumably be obtained in considerable quantities; and whether the Home Department was prepared to recommend aircraft manufacturers to use these private makes of non-poisonous dope in the meanwhile.—Mr. BRACE replied: The Home Office has been in constant communication with the departments concerned, and I understand that the arrangements which were set on foot some time ago for securing an adequate supply of a satisfactory dope free from tetrachlorethane are now approaching completion. It is hoped that the improved dope will shortly be manufactured in such quantities as to meet all requirements. The use of any other non-poisonous dope must depend upon its suitability for aircraft purposes, and this is a matter for the War Office and the Admiralty to decide.

Head Wounds.

Mr. ANNAN BRYCE asked the Under Secretary for War whether the percentage of head wounds, which he stated some months ago was 15 per cent., had now fallen; and, if so, would he say what the percentage now was.—Mr. TENNANT said in reply: No report on this subject has been rendered to the War Office, but I will obtain information.

The Imperial Institute and Experiments on Living Animals.

Mr. GREENWOOD asked the Secretary for the Colonies whether the Imperial Institute could be lawfully used for any purposes other than those mentioned in the charter of incorporation and specified in the First Schedule of The Imperial Institute (Transfer) Act, 1902; whether a part of the institute had been and was now used for experiments upon living animals; whether such experiments came within any one of the purposes specified in the said schedule, and, if so, under which of them; and, if not, whether he would undertake that such experiments should no longer be carried out in any part of the institute.—Mr. BONAR LAW answered: The reply to the first part of the question is in the affirmative, as the honourable Member will see from Section 3 of the Imperial Institute (Transfer) Act, 1902. The laboratory of the University of London, the director of which holds a licence for experiments on living animals, has been situated in the Imperial Institute building for some years past.

MONDAY, MAY 15TH.

Invalid Prisoners of War for Switzerland.

Mr. MALCOLM asked the Under Secretary for Foreign Affairs how soon he expected the Swiss Medical Commission to arrive in this country to take evidence as to German prisoners qualified by illness to be sent to Switzerland; and whether he could give the House any details as to the destinations or probable departure of the first batch of British prisoners for Switzerland.—Lord ROBERT CECIL answered: I regret that I do not known the exact date on which the Swiss Medical Commission will arrive in this country, but the Swiss Government are fully alive to the urgency of the matter. We understand that the first batch of British prisoners will be sent to Château d'Oex and its neighbourhood. It is hoped that the first batches of prisoners may leave this country and Germany by the end of this month.

The Supply of Petrol.

Sir HENRY CRAIK asked the President of the Board of Trade whether his attention had been called to the dearth of petrol for necessary purposes, such as the requirements of the medical services in country districts where long distances had to be traversed; and whether he was prepared to consider regulations which would secure that the supply for such necessary purposes should not be interfered with by its use for purposes of luxury and amusement.—Mr. RUNCIMAN replied: I am aware of the position in regard to petrol in this country, and I appointed a committee to consider what measures are necessary to secure adequate supplies of petrol for the purposes of the war and other essential needs, including medical services. The committee are now inquiring into the whole subject. So far as we can ascertain, the use of private motor-cars is less than it was.

The Re-examination of Recruits.

Mr. TENNANT (Under Secretary for War), replying to Mr. HOGGE, said: My honourable friend may rest assured that no man known rightly to hold a certificate of rejection on medical grounds issued by an authorised official will be required to be re-examined, unless there is reason to believe that his medical disability was of a temporary nature or of a nature which does not preclude his employment in some form of military service.

Sir RYLAND ADKINS asked the Financial Secretary to the War Office what would be the constitution of the medical boards which were to examine men previously rejected for the army on medical grounds; whether such boards would include civilian doctors of good standing in each locality where a board was set up; or, if the constitution of such boards was not uniform, what would be the variations in the constitution of such boards.—Mr. FORSTER replied: The medical boards by which these men will be examined are those which have been appointed and are working in each recruiting area. The presidents are appointed by the War Office and the members are appointed in the commands.

Mr. W. THORNE asked the honourable gentleman whether men who at present held certificates of exemption from military service for medical reasons and who were re-examined and subsequently called up for service would be entitled to adequate financial compensation in the shape of pensions in the event of breakdown in health following military service; and whether the War Office would accept

full financial responsibility for men called up in the circumstances named.—Mr. FORSTER answered: Such men will not be called up unless the medical authorities are satisfied that they are fit for service in the category in which they are placed. They will therefore be upon the same footing as other soldiers for pension.

The Grants for the Treatment of Venereal Diseases.

Major ASTOR asked the President of the Local Government Board what steps had been taken to notify local authorities of the financial help which would be placed at their disposal in order to provide facilities for the diagnosis and treatment of venereal diseases, and what, if any, conditions were attached to the receipt of these grants in aid.—Mr. LONG wrote in reply: I propose to issue immediately a circular letter to local authorities explaining the arrangements which are required for the provision of facilities for the diagnosis and treatment of these diseases and the conditions on which grants will be made for this purpose.

TUESDAY, MAY 16TH.

Medical Men and Motor-car Taxation.

Mr. CATHCART WASON asked the Chancellor of the Exchequer whether, in connexion with the question of exempting the motor-cars used by doctors from increased taxation, he would consider if it would be desirable and practicable to draw a distinction between cars used for business purposes and cars used for pleasure and luxury, so that petrol could be obtained at a more reasonable rate by professional and business persons.—Mr. MCKENNA replied: The existing law provides for repayment of one half of the duty used for supplying motive power to cars used by a medical practitioner or a veterinary surgeon for the purposes of his profession or trade.

Mr. CATHCART WASON: Is the right honourable gentleman aware of the practical impossibility of doctors obtaining petrol in the north?—Mr. MCKENNA: I am afraid that does not come within the purview of my department.

WEDNESDAY, MAY 17TH.

The British Medical Men at Wittenberg.

Mr. MALCOLM asked the Under Secretary of State for War whether the Royal Army Medical Corps doctors, whose gallant behaviour at Wittenberg had been rewarded by His Majesty, were volunteers for that particular work or were detailed by the Germans to do it; and whether other British doctors in other typhus camps in Germany would be recommended for similar recognition.—Mr. TENNANT answered: The three officers mentioned were detailed by the Germans for duty in the typhus camp at Wittenberg. I think my honourable friend may take it that if other officers have done equally good work they will receive equal recognition.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BHATIA, S. L., M.R.C.S., L.R.C.P. Lond., has been appointed Resident House Surgeon at St. Thomas's Hospital.

ECCLES, R. BURTON, M.R.C.S., L.R.C.P. Lond., L.S.A., L.M.S.S.A. Lond., Medical Officer for the East Riding County Isolation Hospital, Great Driffield, East Yorks.

HALL, O., L.R.C.P. & S. Edin., L.F.P.S. Glasg., D.P.H., Medical Officer of Health for Plymouth.

MACKENZIE, FEDE M., M.B., B.S. Lond., Assistant Surgeon to the South London Hospital for Women.

NEWBIGGING, T. D., M.B., C.M. Glasg., Certifying Surgeon under the Factory and Workshop Acts for the Leadhills and Wanlockhead District of the counties of Lanark and Dumfries.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BOLTON UNION.—Resident Assistant Medical Officer for Townleys Hospitals, Farnworth, near Bolton. Salary £250 per annum, with apartments, &c.

BRADFORD CITY.—Two Temporary Female Medical Officers. Salary 8 guineas per week.

BRADFORD, ROYAL EYE AND EAR HOSPITAL.—Non-resident House Surgeon or paid Clinical Assistant.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Female House Physician. Salary £150 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physicians and House Surgeons. Salary at rate of £120 per annum, with board, &c.

BURNLEY, VICTORIA HOSPITAL.—Female House Surgeon. Salary £160 per annum, with residence, &c.

BURY INFIRMARY.—Female Junior House Surgeon. Salary £150 per annum, with board, &c.

DUDLEY, GUEST HOSPITAL.—Assistant House Surgeon for six months. Salary at rate of £120 per annum, with board, &c.

FOLKESTONE, ROYAL VICTORIA HOSPITAL.—Resident Medical Officer. Salary £200 per annum, with board, &c.

GRANGE-OVER-SANDS, WESTMORLAND CONSUMPTION SANATORIUM, Meathop.—Second Assistant. Salary £250 to £250 per annum, with board, &c.

HUDDERSFIELD ROYAL INFIRMARY.—Senior House Surgeon and Assistant House Surgeon. Salaries £150 and £100 per annum, with board, &c

KIRKBURTON, STORTHES HALL ASYLUM, near Huddersfield.—Locum Tenens. Salary £7 7s. per week, with board, &c.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W.—Assistant Resident Medical Officer for six months. Salary at rate of £120 per annum, with board, &c.

MANCHESTER, CITY OF.—Female Medical Officer, to hold Consultations and Infant Clinics at Maternity and Child Welfare Centres, &c. Salary £350 per annum.

MANCHESTER, HULME DISPENSARY, Dale-street, Stretford-road.—House Surgeon. Salary £250 per annum, with apartments, &c.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—Female House Surgeon. Salary £120 per annum, with apartments, &c.

NIGERIA, FREED SLAVES HOME.—Female Medical Missionary.

NOTTINGHAM GENERAL HOSPITAL.—Assistant House Surgeon. Salary at rate of £250 per annum, with board, &c.

NOTTS COUNTY COUNCIL, RANSOM SANATORIUM, Sherwood Forest, Mansfield.—Resident Medical Officer. Salary £200 per annum, with board, &c.

PADDINGTON GREEN CHILDREN'S HOSPITAL, London, W.—Female House Surgeon for six months. Salary at rate of £30 per annum, with board, &c.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—Female District Resident Medical Officer for four months. Salary at rate of £60 per annum, with board, &c. Also Pathologist and Registrar. Salary at rate of £80 per annum and lunch.

ST. GEORGE'S HOSPITAL, S.W.—Radiographer. Salary at rate of £100 per annum.

SHEFFIELD, JESSOP HOSPITAL FOR WOMEN.—Female Junior House Surgeon, unmarried. Salary £80 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SOUTH LONDON HOSPITAL FOR WOMEN, 88-90, Newington-causeway, S.E.—Temporary Female Assistant Physician for six months. Salary 10s. 6d. for each attendance.

STOKE-ON-TRENT INFECTIOUS DISEASES HOSPITAL, Bucknall.—Female Resident Assistant Medical Officer. Salary £200 per annum, with board, &c.

THROAT HOSPITAL, Golden-square, W.—Resident House Surgeon.

VENTNOR, ISLE OF WIGHT, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST.—Assistant Resident Medical Officer.

WIGAN, ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY.—Senior House Surgeon. Salary £250 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Birmingham North, Warwick; and at Chirnside, Berwick.

Births, Marriages, and Deaths.

BIRTHS.

BODY.—On May 11th, the wife of Thomas M. Body, R.A.M.C., of Dowlais House, Middlesbrough, of a daughter.

BYAM.—On May 5th, in Cairo, the wife of Major William Byam, R.A.M.C., of a daughter.

COOKE.—On May 10th, at Clodiagh, Stanmore, the wife of J. Dougla Cooke, F.R.C.S. Eng., R.A.M.C., of a daughter.

JONES.—On May 4th, at Walmer House, Aldridge, to Margaret, the wife of Captain R. Francis Jones, R.A.M.C., a daughter.

NEWSHOLME.—On May 7th, at Lingfield-avenue, Kingston-on-Thames, the wife of Lieutenant Henry Pratt Newsholme, R.A.M.C., of a son.

MARRIAGES.

PEGG—GILBERTSON.—On April 29th, at St. Saviour's Church, Hitchin, John Henry Pegg, B.A., M.R.C.S., L.R.C.P. Lond., to Kathleen Elsie, younger daughter of Dr. and Mrs. J. H. Gilbertson.

ROBERTS—BROOKS.—On May 2nd, at Presbyterian Church, Kingston-on-Thames, Captain Alan T. Roberts, R.A.M.C., to Marjorie, daughter of Mr. and Mrs. William Brooks, of Sydney, N.S.W.

SMITH—BINNIAN.—On May 2nd, at St. Mark's Church, Hamilton-terrace, N.W., T. F. Hugh Smith, F.R.C.S. Eng., to Alice Charlotte, second daughter of T. W. Binnian, of Kidderminster.

DEATHS.

HARRISON.—On May 5th, suddenly, at Belize, British Honduras, the Hon. J. H. Hugh Harrison, J.P., F.R.G.S., M.R.C.S., aged 52 years.

KROHN.—On May 5th, at Arosa, Switzerland, Ronald E. S. Krohn, M.D. Lond.

LEA.—On May 7th, at Dunkirk-road, Birkdale, Southport, Arnold William Warrington Lea, M.D. Lond., F.R.C.S. Eng., in his 49th year.

LOWNDS.—On April 28th, James Richard Lownds, M.R.C.S., L.S.A. Lond., of The Elms, Newcastle-on-Tyne, aged 82 years.

MAITLAND.—On May 7th, at Ridge Mount, Winchmore Hill, Lytton Pelham Maitland, M.D., B.S. Lond., D.P.H. Cantab., aged 36 years.

ROBINSON.—On May 7th, at East Kirkby Manor, Spilsby, Lincs., Tom Robinson, M.D. Brux., aged 68 years.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

MEDICAL NOTES ON HISTORICAL MANUSCRIPTS.

LAST year we published some excerpts[1] by a frequent contributor from a collection of State and family documents, now the property of the Duke of Portland. They contained references to medical and quasi-medical matters of the past, which were found by some readers interesting and amusing. The extracts given below are from the same contributor and may prove of equal interest.

The Hatfield House Papers.

The Historical Manuscripts Commissioners have now issued the thirteenth volume of the "Calendar of the Manuscripts of the Marquis of Salisbury preserved at Hatfield House, Hertfordshire," and at least one other volume is promised in the near future. It is pointed out in an introductory article that "the Cecil Manuscripts, although forming a private collection, may be justly regarded in the light of a national treasure. Their value is not to be described by the mere statement that they contribute to the elucidation of one of the most remarkable epochs of English history; no complete narrative of the period to which they relate could be constructed without their aid. They represent, in fact, a detached portion of the State correspondence during the memorable administration of Sir William Cecil, afterwards Lord Burghley, and of his son, Sir Robert Cecil, first Earl of Salisbury, without which the national muniments would exhibit a very imperfect record of the transactions of those stirring times." These Hatfield House papers are not so rich proportionately in reference to medical matters as are some other of the collections dealt with by the Historical Manuscripts Commission, but that they contain documents of more or less remote interest to the profession will be seen by the extracts which we subjoin from the Calendar. In some instances, it will be observed, the substance only of the correspondence is briefly indicated, whilst in other cases the actual text is quoted.

Illness of the Queen of Scots.—The physicians of the Queen of Scots and others to the Earl of Shrewsbury, 1572, June.—The letter which the Queen writes you was signed yesterday, but it is dated to-day, because bearer could not leave sooner. Her Majesty gets worse every hour and therefore think right to advertise him of the same. Nothing remains on her stomach; she vomited 10 or 12 times last night, nothing but phlegm. For some days she has hardly eaten anything. The fever has increased. In her great illness of the winter a year ago she had little fever, and they fear that this evil, which accompanied the pain in her side and stomach, is alone sufficient to imperil her life. Ask for speedy help, otherwise they fear it will arrive too late.—Sheffield Castle, June, 1572.

A Doctor's Grievance.—Sir Thomas Gresham to Lord Burghley, London, 1573, Aug. 9.—Craves Burghley's letter of discharge for Dr. Langton, one of his medical attendants, whom the physicians mean to send to Ireland, for which he is very unfit, being sore indebted and 60 years of age. Langton has been very evilly handled by one Dr. Ludford "in plucking down his testimonial upon the Royal Exchange of the cures he hath done, here and otherwise, since his coming hither, which was never seen the like done." Desires Burghley to procure the Queen's warrant to the physicians and all others that Langton be no further molested. "I believe, if it be to your lordship's pleasure to use him, he will, with the leave of God, heal you of your gout, if he do take upon him to do it." Dr. Ludford is a fit man to be sent to Ireland "as well for his experience of pothecary ware as for his physic."

Bath and Buxton Waters.—The Earl of Leicester to Lord Burghley, 1577, June 13 [presumably from Bath].—Touching his health, he and his brother have great cause to like and commend the water. They observe their physician's order diligently, and find great pleasure both in drinking and bathing in the water. Thinks it would be good for Burghley, but not if he does as they hear he did last time, take great journeys abroad 10 or 12 miles a day and use liberal diet with company dinners and suppers. They take another way—dining two or three together now Lord Pembroke is there, having but one dish, or two at most, and taking the air afoot or on horseback moderately. If Burghley comes next year, as he says, let him not bring too many with him. The house is so little as a few fills it, and hard then to keep sweet.

The Earl of Leicester to Lord Burghley, 1577, July 23.—Her Majesty wills him to write earnestly to Burghley to send her a tun of Buxton water in hogsheads, which are to be thoroughly seasoned with the water beforehand.

The Same to the Same, 1577, Aug. 8.—Your water is here safely arrived, and I told her Majesty of it, who, now it is come, seemeth not to make any great account of it. And yet she more than twice or thrice commanded me earnestly to write to you for it, and after I had so done asked me sundry times whether I had remembered it or no, but it seems her Majesty doth mistrust it will not be of the goodness here it is there; besides, somebody told her there was some bruit of it about, as though her Majesty had had some sore leg. Such like devices made her half angry with me for sending to you for it, but I had rather be shent so than not to have performed her express commandment before. Nevertheless, she thanks your lordship for the well and careful sending of it. She is well in health and without any other grief but the old aching sometimes when she takes cold in her legs.

The Earl of Sussex to Lord Burghley, Aug. 7, 1582.—Found the well so cold, by reason of the ill-weather, as he could not but very seldom have use of it. The water he had drunk liberally, beginning with three pints, and so increasing daily a pint till he came to eight pints, and thence descending daily a pint till he shall again return to three pints, which will be on Thursday next. Means to return after he shall have made an end of the drinking.

Treatment of "The Purples."—Sir Henry Unton[2] to the Earl of Essex.—I acknowledge your favour in writing to me by Symondes and beseech you to excuse my hasty and short scribble, being scarce able to put pen to paper by a fall from my horse, which putteth me to great pain and taketh away the use almost of my whole arm.—From Coucye, this 4th of March, 1585.

M. de Montmartin to the Earl of Essex.—The extreme sickness of Sir H. Unton is a matter of much regret to all the well disposed at the Court. The King went to see him yesterday.—The Camp before La Fere, 25 March, 1595-6.

Sir Henry Unton to Lord Burghley, 1595-6, March 17.—On the subject of his sickness; and giving an account of his interview with the King of France, who, "although dissuaded by his own physicians that do attend me, for the danger of contagion," on Unton's wishing it came to him, saying that "he had not hitherto feared the harquebuse shot, and did not now apprehend the purples."

Sir Henry Unton to the Earl of Essex, from Coucy, March 17, 1595-6.—A despatch on the subject of his mission, and saying "I am sorry that by reason of the extremity of my present sickness I am not able to make that answer to your letters which I desire." The following is underwritten: "We have been forced for the authority of this dispatch to make my lord ambassador act more the whole man than truly he is; but I assure your lordship he is yet in very great peril, having his fever continually upon him, which hath brought him to great weakness, and doth not suffer him to take any kind of rest. I hope, notwithstanding, that within six or seven days, above which time his extremity cannot last, he will be able to despatch me."—Tho. Edmondes.

William Paule to the Earl of Essex, from Coucy, March 21, 1595-6.—I came hither on Friday last, not without some dangers escaped as well by sea as land. But the worst of ills is that I found my lord ambassador in such miserable weak state that all men despaired of an hour's longer life. His sickness (a malignant hot fever) began with extremity in his head, and about the seventh day his utterance failed him; but this accident was no sooner cured by the careful learned skill of the King's physician (De Lorrayne, doctor of Montpellier), but certain purple spots appeared about his heart, whereupon with the advice of La Ryviere, the other physician, they gave him *Confectio Alcarmas* compounded of musk, amber, gold, pearl, and unicorn's horn, with pigeons applied to his side, and all other means that art could devise, sufficient to expel the strongest poison and he be not bewitcht withal. These accidents being holpen, which arose of the malignity of his disease, yet his grief increased worse and worse; but the 17th day of his sickness, and the 20th of March, being his last critical day, was worst of all, so that in the accidents of sickness his sickness is cured, and yet he is extremely sick still. This present Monday is the one and twentieth day of his disease, in which space he hath not slept, to their seeming which watch about him: his food is only jelly, and such nutritive extracted matter, and albeit his body be brought so low that nature seemeth altogether spent, yet his memory and speech serve him perfectly though to little use. God is Almighty, and may do much to restore him contrary to man's expectation, and therefore I purpose to expect the end. [Sir Henry Unton died a day or two afterwards.]

(To be continued.)

HEALTH AND SANITATION IN BRITISH EAST AFRICA.

A REPORT on the affairs of the East Africa Protectorate for the year 1914-15 has been prepared by Mr. C. C. Bowring, C.M.G., the Chief Secretary and Deputy Governor. The area of the Protectorate is approximately 200,000 square miles, and the population has been estimated at 4,000,000 but no complete census has ever been taken. It appears from the medical section of Mr. Bowring's report that in the Coast Zone there has been a notable decrease of malaria. During the year there were 7 cases of blackwater fever with 3 deaths, two of the victims being Europeans. There were 33 new cases of cerebro-spinal meningitis in Mombasa with 15 deaths. There were only 2 cases of plague (both fatal), as compared with 203 in the previous year—a tribute to the soundness of the antiplague campaign inaugurated by Professor Simpson in 1914. Dysentery is still prevalent at Mombasa amongst the Kikuyu labourers. In the Mountainous Zone 3851 patients were treated for malaria—a larger number than usual; and in Nairobi the infection appears to be widespread amongst natives, as post-mortem examination reveals a large percentage with enlarged spleen. There were 8 cases of blackwater fever, 1 (European) being fatal; 136 cases of cerebro-spinal meningitis with 51 deaths; and 9 cases of plague in Nairobi with 6 deaths. In the Kenya and Nyanza Provinces over 4000 cases of malaria were treated, and there were 45 cases of cerebro spinal meningitis with 28 deaths—a decided decrease as compared with the previous year. Forty-one cases of plague occurred amongst natives, 38 of which proved fatal, and there was one case of a European woman, who recovered. In the Desert Zone there was an appreciable decrease in the number of cases of communicable diseases. Two cases of blackwater fever were reported—the first that have been brought to notice in

[1] THE LANCET, vol. i., 1915, pp. 56, 111, and 168.

[2] Sir Henry Unton had been sent at this time by Queen Elizabeth as a special ambassador to King Henry IV. of France.

this zone since 1902. Beri-beri is still liable to be a source of anxiety in the upper reaches of the Juba. The type, however, appears to be milder, 70 cases being treated as out-patients and 2 as in-patients, with no deaths. Anti-malarial measures are being actively prosecuted in Mombasa, Nairobi, and Kisumu, the presence of sanitary inspectors exercising a beneficial influence. Quinine prophylaxis has been adopted in various localities with some amount of success. "Millions" fish have been imported from Zanzibar and have been established in tanks at Mombasa. No sewage works have yet been installed in any township in the country; night soil is disposed of by dumping into the sea, trenching, reception into cesspools, or distribution on the ground. The outbreak of war and consequent financial disturbance has resulted in the much-needed water schemes for Kisumu and Nakuro being either held in abeyance or materially curtailed; the proposed new water-supply for Mombasa has not yet reached that town; and the protective works at Nairobi intake have not been commenced. The European population of the Protectorate includes about 400 in Nyanza Province, 1600 in Naivasha Province, 243 in Kenya Province, 2800 in Ukamba Province, 360 in Seyidie Province, and smaller contingents in other districts.

J.W.S.—Sinn Fein means literally "ourselves." The words are the title and expression of a movement which denies the lawful existence of the Incorporating Union in contra-distinction to Unionism and Parliamentarianism. Sinn Fein declares Ireland to be by natural and constitutional right a sovereign State, and teaches that the election of Irishmen to serve in the British Parliament is treason to the Irish State, as no lawful power exists, has existed, or can exist in that Parliament to legislate for Ireland. It advocates the withdrawal of the Irish representation from Westminster and the formation in Ireland of a voluntary legislature endowed with the moral authority of the Irish nation.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, May 17th, 1916.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radiation Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
May 11	30·060	S.	...	80	58	46	48	50	Cloudy
,, 12	29·970	S.W.	0·30	103	64	50	53	54	Overcast
,, 13	29·820	N.W.	...	74	55	51	51	52	Raining
,, 14	29·910	W.	0·10	99	61	45	50	57	Cloudy
,, 15	29·640	W.	...	107	67	53	55	57	Cloudy
,, 16	30·060	N.W.	...	91	62	48	51	55	Cloudy
,, 17	30·280	S.W.	...	104	70	53	54	56	Cloudy

BOOKS, ETC., RECEIVED.

BAILLIÈRE, TINDALL, AND COX, London.
The After Treatment of Operations. By P. Lockhart-Mummery, F.R.C.S. Eng., B.A., M.B., B.C. Cantab. Fourth edition. Price 5s. net.
Operative Midwifery. By J. M. Munro Kerr, M.D., C.M. Glasg. Third edition. Price 25s. net.
Diseases of Infants and Children. By H. D. Chapin, A.M., M.D., and Godfrey Roger Pisek, M.D., Sc.D. Third revised edition. Price 15s. net.
Veterinary Therapeutics. By E. Wallis Hoare, F.R.C.V.S. Third edition. Price 18s. net.

CASSELL AND CO., LIMITED, London.
Serums, Vaccines, and Toxins in Treatment and Diagnosis. By William Cecil Bosanquet, M.A., M.D. Oxon., F.R.C.P. Lond., and John W. H. Eyre, M.D., M.S. Dunelm, F.R.S. Edin. Third edition, illustrated. Price 9s. net.

CHURCHILL, J. AND A., London.
Cure of Obesity and Obese Heart. By J. S. Kellett Smith, F.R.C.S. Eng. Price 3s. 6d. net.

LEWIS, H. K., AND CO., London.
Pathology of Tumours. By B. H. Kettle, M.D., B.S. Lond. Price 10s. 6d. net.

LONGMANS, GREEN AND CO., London.
Respiratory Exchange of Animals and Man. By August Krogh, Ph.D. Copenhagen. Price 6s. net.

WRIGHT, JOHN, AND SONS, Bristol.
The Medical Annual, 1916. Price 10s. net.

The following magazines, journals, &c., have been received:—British Dental Journal, West London Medical Journal, Annali d'Igiene, Cleveland Medical Journal, Therapeutic Gazette, Medicinskt Arkiv, Quarterly Journal of Medicine, Medical Review, British Journal of Children's Diseases, Public Health, St. Paul Medical Journal, Quarterly Journal of Experimental Physiology, Journal of Anatomy and Physiology, Edinburgh Medical Journal, Canadian Medical Association Journal, American Journal of Orthopedic Surgery, Ophthalmology, Journal of State Medicine, Surgery, Gynecology, and Obstetrics, Maryland Medical Journal, Archives of Pediatrics, Archives of Radiology and Electrotherapy, American Journal of Clinical Medicine, Medical Review of Reviews, Annals of Tropical Medicine and Parasitology, Medical Times, British Journal of Dental Science, &c.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.
THURSDAY.—4.30 P.M., Bakerian Lecture:—Prof. C. G. Barkla: X Rays and the Theory of Radiation.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MEETINGS OF SECTIONS.

Monday, May 22nd.

ODONTOLOGY (Hon. Secretaries—F. R. Smyth, F. N. Doubleday): at 8 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1916-1917.
Paper:
Dr. J. Howard Mummery: The Structure and Arrangement of the Enamel Prisms, especially as shown in the Enamel of the Elephant.

Tuesday, May 23rd.

MEDICINE (Hon. Secretaries—Charles R. Box, W. Cecil Bosanquet): at 5.30 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1916-1917.

Wednesday, May 24th.

HISTORY OF MEDICINE (Hon. Secretaries—Leonard G. Guthrie, J. D. Rolleston): at 4.30 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1916-1917.
Dr. Michael Foster: Stick Pomanders.
And other Exhibits.
Papers (at 5 P.M.):
Dr. J. A. Nixon and Dr. Charles Singer: Miniatures of the Bristol Guy de Chauliac MS.
Dr. Charles Singer: Some Figures bearing on the Practice of Blood-letting in the Fourteenth, Fifteenth, and Sixteenth Centuries.
Mr. R. R. Steele: A Note on the Scientific Work of Roger Bacon.

Thursday, May 25th.

NEUROLOGY (Hon. Secretaries—H. Campbell Thomson, C. M. Hinds Howell): at 8 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1916-1917.
Clinical Cases will be shown, and anyone desiring to show Cases is requested to communicate immediately with the Hon. Secretary, Dr. Hinds Howell, 145, Harley-street, W.

Friday, May 26th.

STUDY OF DISEASE IN CHILDREN (Hon. Secretaries—J. D. Rolleston, A. S. Blundell Bankart, Sidney Gilford): at 4.30 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1916-1917.
Cases:
Dr. Eric Pritchard: Severe Rickets.
Dr. W. Mitchell Smith: (1) Pigmented and Hairy Nævus with Molluscous Tumours; (2) Giantism.
Dr. E. Cautley: (1) Infantilism; (2) Optic Neuritis (two cases).
Mr. A. S. Blundell Bankart: Hemihypertrophy.
Dr. J. Walter Carr: Juvenile General Paralysis.
Short Paper:
Dr. J. Lawson Dick: The Teeth in Rickets.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operation. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).
TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).
WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).
THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. B. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden square, W.
MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.
TUESDAY.—3 P.M., Prof. C. S. Sherrington: Unconscious Nerves—their Functions in External Life. (Lecture II.)
FRIDAY.—5.30 P.M., Prof. C. G. Barkla: X Rays.

UNIVERSITY OF BIRMINGHAM, Lecture Theatre of the Medical School.
WEDNESDAY.—4.30 P.M., Ingleby Lecture:—Dr. T. S. Short: Gastric Ulcer and its Complications.

MANAGER'S NOTICES.

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